C21.5: 959/3

Vol. 959 Number 3

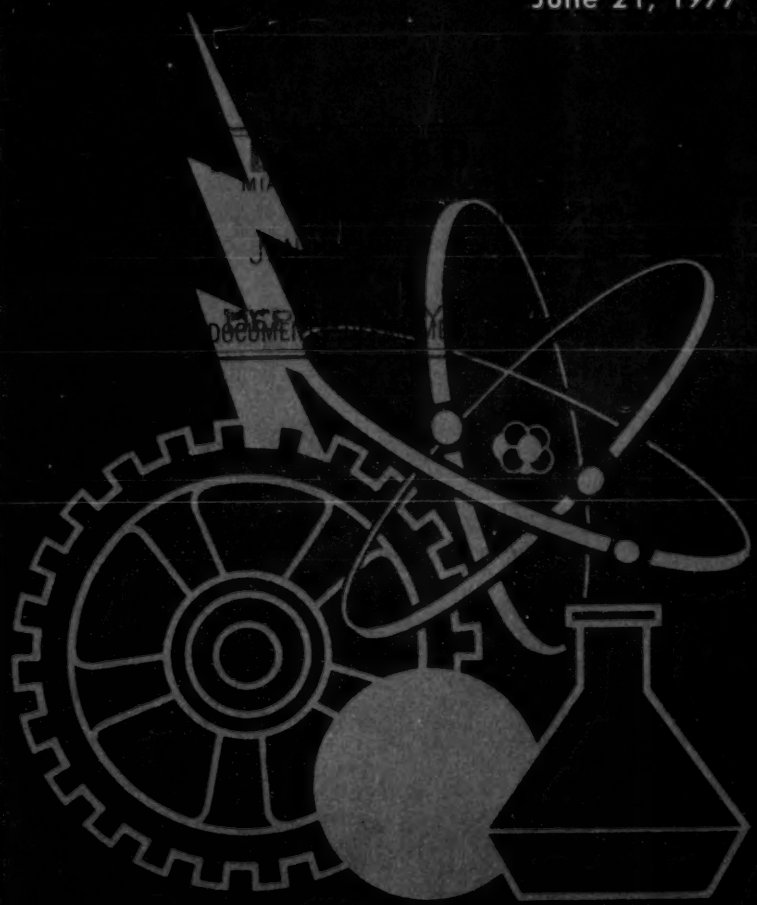
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

June 21, 1977



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

June 21, 1977 Volume 959 Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Notice of Abandonment for Failure to Prosecute Application	959 OG 24
Registration to Practice	959 OG 24
United States Patent and Trademark Office Before the Commissioner of Patents and Trademarks	959 OG 25
Patent Suits	959 OG 25
Reissue Applications Filed	959 OG 26
Patent Notices	
Certificates of Correction for the Week of June 21, 1977	959 OG 28
National Technical Information Service	959 OG 28
Condition of Patent Applications	959 OG 34
Reissue Patents Granted (29,267)	937
Plant Patents Granted (4,062)	941
Patents Granted	
General and Mechanical (4,030,139)	943
Chemical (4,030,880)	1191
Electrical (4,031,308)	1305
Design Patents Granted (244,726)	1395
Index of Patentees	PI 1
Indices of Reissues, Plants and Designs	PI 48
Classification of	
Patents (Including Reissues)	PI 51
Designs and Plants	PI 54
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 55
Designs and Plants	PI 57

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum for first class mailing, also available as fourth-class mail at $250.00; foreign mailing $85.55 additional; single copies $6.60 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS, price 60 cents each.

CIRCULARS OF GENERAL INFORMATION concerning TRADEMARKS, price 50 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Notice of Abandonment for Failure to Prosecute Application

Effective immediately the Patent Examining Corps will mail a communication, concerning all applications becoming abandoned in the Corps for failure to prosecute, to the correspondence address of record.

The communication to be mailed will merely comprise a copy of the first page of the Office action, to which applicant failed to properly respond, the copy including stamped language thereon indicating that the application has become abandoned and the date that the copy was mailed. The language stamped on the copy will be as follows: APPLICATION HAS BECOME ABANDONED. THIS NOTICE MAILED: ————————. In no case will the mere failure to receive a notice of abandonment affect the status of an abandoned application.

This new procedure should enable applicants to take appropriate and diligent action to reinstate an application inadvertently abandoned for failure to timely respond to an official communication. In most cases, a petition to revive under 37 CFR 1.137 will be the appropriate remedy. It may be that a response to the Office action was mailed to the Office with a certificate of mailing declaration as a part thereof (notice of October 26, 1976; 951 O.G. 1342) but was not received in the Office. In this instance, adequate relief may be available by means of a petition to withdraw the holding of abandonment.

In any instance, if action is not taken promptly after receiving the notice of abandonment, appropriate relief may not be granted.

If a lack of diligent action is predicated on the contention that neither the Office action nor the notice of abondonment was received, one may presume that there is a problem with the correspondence address of record. Accordingly, your attention is directed to recent notices of May 28, 1975, and September 9, 1976, dealing with changes of address (935 O.G. 1352 and 951 O.G. 454). In essence, it is imperative that a paper notifying the Office of a change of address be filed promptly in *each* application in which the correspondence address is to be changed.

If an application is abandoned or a patent lapsed for an excessive time a terminal disclaimer may be required. A terminal disclaimer may also be required where the holding of abandonment or lapse is withdrawn but a determination is made that action attempting to correct the problem should have been taken in a more diligent manner.

WILLIAM FELDMAN,

May 9, 1977. *Deputy Assistant Commissioner for Patents.*

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before July 15, 1977.

LUTRELLE F. PARKER,

Deputy Commissioner of Patents and Trademarks and Chairman, Committee on Enrollment.

A

Adams, Jerome J., 1400 Lake Shore Dr., Chicago, Ill. 60610
Aksman, Stanislaus, 1400 S. Joyce St., #B–513, Arlington, Va. 22202
Arnold, Bruce Y., 513 Walker Rd., Great Falls, Va. 22066

B

Baumgardner, Carl A., 1082 Commonwealth Ave., #203, Boston, Mass. 02215
Bennett, David, 31 Brookside Dr., Wilbraham, Mass. 01095
Bird, Nancy A., 135 W. 77th St., New York, N.Y. 10024
Boehnen, Daniel A., 1221 N. Dearborn, #4015, Chicago, Ill. 60610
Boxer, Matthew, 1021 Arlington Blvd., #1033, Arlington, Va. 22205
Brouns, Harold G., 303 Myrtle Ave., Foodbury, N.J. 08096
Brown, Ward, 515 N. 50th St., #304, Seattle, Wash. 98103
Brunda, Bruce B., 221 Oakwood Ave., Staten Island, N.Y. 10301
Byrne, Richard L., 1308 S. 28th St., #1, Arlington, Va. 22206

C

Callahan, Edward T., 237 54th St., #3D, New York, N.Y. 10022
Carr, Joseph C., Jr., 7291 Woodstead Ct., #2, St. Louis, Mo. 63121
Carwell, Robert, 520 Michigan, #2E, Evanston, Ill. 62222
Castiglione, John R., 12 Bay State St., Pittsfield, Mass. 01201
Connelly, Thomas J. 7711 Adams St., Forest Park, Ill. 60130
Cross, Perry G., 608 Monroe St., #2, Ann Arbor, Mich. 48104
Cummings, Ronald G., 4011 S. Union St., Des Moines, Iowa 50315
Cutter, Lawrence D., 49 Morris St., Albany, N.Y. 12208

D

DeBenedictis, Joseph, 51 Garden View Terr., #4, Hightstown, N.J. 08520
Deinken, John J., 2100 Transco Tower, Houston, Tex. 77056
DePaul, Louis A., R 527 Sewickley St., Greensburg, Pa. 15601
DeShea, Michael J., 10 Outlook Ave., RD 3, Saratoga Springs, N.Y. 12866
Devinsky, Paul, 1741 S St. NW., Washington, D.C. 20009
Devitt, Jerald J., 14734 W. Ellsworth, Ave., Golden, Colo. 80401
Durando, Antonio R., 4348 S. Jupiter Dr., Salt Lake City, Utah 84117

E

Eckerling, Herbert, 20336 Coraline Circle, Chatsworth, Calif. 91311
Egan, William J. II, 2216 Quenby, Houston, Tex. 77005
Elacqua, James J., 1010 Lawson Dr., Garland, Tex. 75042

F

Fassbender, Charles J., 3517 Deep Valley Trail, Plano, Tex. 75074
Fisher, John A., 3923 S. Poplar St., Tempe, Ariz. 85282
Fitch, Morgan L. IV, 3933 Forest Glen Dr., Knoxville, Tenn. 37919
Forzano, Ernest A., 937 Victory Blvd., Staten Island, N.Y. 10301
Foster, George A. Jr., 2218 E. Jackson Blvd., Elkhart, Ind. 46514
Fuchs, Bartin I., 1121 New Hampshire Ave. NW., Apt. 502, Washington, D.C. 20032

G

Gabrielson, Donald P., P.O. Box 742, Kekaha, Hawaii 96752
Galbraith, James W., 68–H Clintwood Court, Rochester, N.Y. 14620
Gates, Clayton S., 7 E. 14th St., #1127, New York, N.Y. 10003
Gess, Erich J., 2400 S. Glebe Rr. #319, Arlington, Va. 22206
Geyer, William E., 6318 Apt. A, Oriole Dr., Dallas, Tex. 75209
Godar, Michael E., 9900 Crestwick Dr., St. Louis, Mo. 63128
Goldman, Stephen B., 8701 Southwestern Blvd., #1–242, Dallas, Tex. 75206
Goodwin, Beverly B., 103 Hoover Court, Paramus, N.J. 07652
Gratton, Stephen A., 2064 S. Zang Way, Lakewood, Colo. 80228
Grayson, George, 9 Suzanne Rd., Lexington, Mass. 02173
Greenbaum, Elias, 1161 York Ave., #6F, New York, N.Y. 10021
Greenbaum, Michael C., 918 N. Quincy St., Arlington, Va. 22203
Grudzinskas, Charles V., 21 5th Ave., New York, N.Y. 10960

H

Haliw, Andrew J. III, 3539 Janet Dr., Sterling Heights, Mich. 48077
Hamilton, James D., 830 Azalea Dr., Rockville, Md. 20850
Hanlon, William M. Jr., 239 Shasta Dr., Pittsburgh, Pa. 15239
Hartmann, Heinz M., 625 Hannah Ave., Forest Park, Ill. 60130
Hayter, Robert P., 4863 Pembridge Circle, Syracuse, N.Y. 13215
Heist, Dale M., 49 Black Rock Rd., Yardley, Pa. 19067
Hensley, Stephen L., 4745 Lake Trail Dr., #3D, Lisle, Ill. 60532
Hickman, Paul L., 904 Lathrop Dr., Stanford, Calif. 94305
Hill, David J., 112–C Briaridge Dr., Turtle Creek, Pa. 15145
Huband, Frank L., 3800 N. Fairfax Dr., #1414, Arlington, Va. 22203

J

Jackson, Douglas E., 8606 Ridge Rd., Bethesda, Md. 20034
Jay, Robert L., 73 Carlton Ave., #A–5, Port Washington, N.Y. 11050
Jenkins, Richard E., 1223 Belgrave Pl., Charlotte, N.C. 28203
Jobe, Jonathan E. Jr., 11006 Sagepark Lane, Houston, Tex. 77089

K

Kapoor, Brij M., 5755 Mountain Creek Rd. NE., Atlanta, Ga. 30328
Kasper, Horst M., 13 Forest Dr., Warren, N.J. 07060
Kaufman, Michael A., 1223A Valley Rd., Wayne, N.J. 07470
Keen, Joseph W., 44 Mount Vernon Ave., Export, Pa. 15632
Kerstein, Paul A., 8923 Knight, #309, Des Plaines, Ill. 60016
King, William A., 105 NE. Jackson, Hillsboro, Oreg. 97123
Kipnes, Allen R., 516 3rd St., Franklin Square, N.Y. 11010
Kowalski, Frank J., Sea Sprite Apts., 1016 Strand, Hermosa Beach, Calif. 90254
Kroboth, Timothy R., 3511 Paul St., Alexandria, Va. 22311

L

Leitten, Brian J., 4218 32nd St. S., Arlington, Va. 22206
Levin, Jerome A., 2320 W. Rhodes Ave., Anaheim, Calif. 92801
Lieberman, Lance J., 50 Elm Dr., Roslyn, N.Y. 11576
Lischer, Dale, 1313 Ritchie Ct., #402, Chicago, Ill. 60610
Little, Douglas B., 4462 Yorkdale Dr., Stow, Ohio 44224
Livingston, Edward M., 1216 Walsh Ave., #25U, Coral Gables, Fla. 33146
Lopez, Gabriel, 9185 E. AB Ave., Richland, Mich. 49083
Lott, Robert D., 808 N. 82nd St., #F–214, Scottsdale, Ariz. 95257
Love, George R., 2940 Binkley, #3, Dallas, Tex. 75205
Lumb, John T., 34 Latimer Dr., East Lyme, Conn. 06333
Lupo, Kenneth G., 276 Eigenmann Hall, Bloomington, Ind. 47401

M

Mack, Ann E., 4910 Arterest, #E, Midland, Mich. 48640
Marshall, Robert D. Jr., 1301 N. Court House Rd., #B–1, Arlington Va. 22201
Martin, William L. Jr., 779 W. Washington, Stephenville, Tex. 76401
McBride, Curtis W., 106 White Circle, Niceville, Fla. 32578
McDaniel, Terry B., 222 Custis St., #A, Aberdeen, Md. 21001
Mear, William E. III, 300 Manor Dr., E. Syracuse, N.Y. 13057
Meason, William E., 6225 Cataline Ave., Oak Forest, Ill. 60452
Miklos, Joseph, 5800 Arlington Ave., Bronx, N.Y. 10471
Milks, William C. III, 2951 Linwood Ave., #C, Cincinnati, Ohio 45208
Mitzner, Marvin B., 34—20 Parsons Blvd., Flushing, N.Y. 11354
Monroe, James H., Timber Trails, Sherman, Conn. 06784
Monsanto, Raphael, 1165 Rt. 22, #193, North Plainfield, N.J. 07060
Moore, McPherson D., 224 Village Green Pkwy., #6, Chesterfield, Mo. 63017
Mukal, Robert G., 4760 Southland Ave., Alexandria, Va. 22312
Muller, John J. II, 1623 Missouri Ave., St. Louis, Mo. 63101
Mulloy, Robert E. Jr., 800 W. Santa Fe Trail, Kansas City, Mo. 64145

N

Nametz, Michael A., 10201 Harwin, #2212, Houston, Tex. 77036
Ness, Anton P., R.D. #2 Dillsburg, Pa. 17019
Nixon, Dale B., 4107 Harvest Hill Rd., #1187, Dallas, Tex. 75234

O

Ohlson, Glenn W., 284 N. Main St., Glen Ellyn, Ill. 60137
Ostaszewski, Philip J., 1900 S. Eads St., #222, Arlington, Va. 22202

P

Peacock, Bruce E., 12 Lowell House, Sherry Lake Apts., Conshohocken, Pa. 19428
Perry, Glenn J., 7044 Knighthood Lane, Columbia, Md. 21045
Petraske, Eric W., 124 Strathmore Gardens, Matawan, N.J. 07747
Petri, Ronald C., 4428 N. Malden, Chicago, Ill. 60640
Phelps, Mark E., 309 Carriage Hill Rd., Naperville, Ill. 60540
Poissant, Brian M., 233 E. 69th St., New York, N.Y. 10017
Purcell, Robert E., 5523 Oak Pl., Bethesda, Md. 20034

R

Rafter, John R., 111 Franklin Ave., #3K, New Rochelle, N.Y. 10805
Rigney, Gary L., 4009 Lucerne Dr. SE., Huntsville, Ala. 35802
Roberts, Larry, 9601 Wilshire Blvd., Suite 244, Beverly Hills, Calif. 90210
Rogers, Laurence S., 49 W. 12th St., New York, N.Y. 10011
Roszak, Thomas E., 1600 NE. Redbud, #301, North Kansas City, Mo. 64116
Roth, Steven H., 35 E St. NW., #613, Washington, D.C. 20001
Rudershausen, Charles G., Taylor Lane, Kennett Square, Pa. 19348
Ruggiero, Charles N., 1635 W. 12th St., Brooklyn, N.Y. 11223
Ryan, Mary A., 12 West Dr., Massapequa, N.Y. 11758

S

Samlan, Alan B., 1766 Azalea Pl., Mount Prospect, Ill. 60056
Sartorio, Henry P., 2430 Pennsylvania Ave. NW., #526, Washington, D.C. 20037
Schlifke, James S., 315C Hawthorne, Glencoe, Ill. 60022
Schmit, David E., 7926 Wild Orchard Lane, Cincinnati, Ohio 45242
Seward, DeWitt C. III Box 434, Bethel, Conn. 06801
Shulsinger, Joseph, 26907 Indian Peak Rd., Rancho Palos Verdes, Calif. 90274
Simmons, James C., 2605 W. Kirby St., Tampa, Fla. 33614
Simons, Philip Y., 24 Francis Rd., East Brunswick, N.J. 08816
Sinder, Fredric L., 4488 B2 Riverside Dr., Dayton, Ohio 45405
Skinner, Kathleen A., 325 Ortega St., San Francisco, Calif. 94122
Slone, David N., 857 Channing Ave., Palo Alto, Calif. 94301
Southworth, Robert III, 5408 Purcell, Albuquerque, N. Mex. 87111
Stanback, Clarence F. Jr., 1916 Wilson Lane, #204, McLean, Va. 22101
Steinberg, William H., 6 Appleton St., Suncook, N.H. 03275
Stroup, Richard L., 1850 Mintwood Pl. NW., Washington, D.C. 20010
Stuart, Donald R., 300 N. State St., #4924, Chicago, Ill. 60610
Sullivan, Stephen F. Jr., 27021 Pueblo Nuevo Dr., Mission Viejo, Calif. 92675

T

Todd, William G., 205 Motley St., Valley Stream, N.Y. 11580
Tramaloni, Dennis P., 2807 Schurz Ave., Bronx, N.Y. 10465
Tschida, Douglas L., 1919 Silverbell Rd., #202, Eagan, Minn. 55122
Tyson, Thomas E., 2636 Coldsprings Dr., Xenia, Ohio. 45385

U

Uffelman, Malcolm R., 1808 Horseback Trail, Vienna, Va. 22180
Upchurch, Gregory E., 103 Carriage Path S., Milford, Conn. 06460

V

Verdirame, Bartholomew, 159–14 85th St., Howard Beach, N.Y. 11414
Viger, Andrew S., 783 Quince Orchard Blvd., #24, Gaithersburg, Md. 20760

W

Watson, Louis W., 2611 SW. 30th St., Oklahoma City, Okla. 73119
Weins, Michael J., P.O. Box 2375, Grand Central Station, New York, N.Y. 10017
Weiss, Stephen Z., 1354 Sunnyside, Highland Park, Ill. 60035
West, William D., 9904 N. 34th St., Omaha, Nebr. 68112
Wichert, Karl, 621 Harvard Ave. E., Seattle, Wash. 98102
Willenberg, Wayne E., 3 Clipper Rd., #C, Rancho Palos Verdes, Calif. 90274
Williams, Stephen P., 246 Edgbrook Dr., Boylston, Mass. 01505
Winner, Ellen P., 1700 S. Boulder Rd., #400, Lafayette, Colo. 80026
Wolirab, James E., 16 Summerhill Lane, Manchester, Mo. 63011
Woodruff, George N., Box 517 Rte. 3, Merritt Island, Fla. 32952

Y

Yakimo, Michael Jr., 5826 Holmes, Kansas City, Mo. 64110
Young, Jeffrey E., 1095 St. Charles Pl., Atlanta, Ga. 30306

Z

Zborovsky, Ilya, 35–16 76th St., New York, N.Y. 11372
Zeller, James P., 4300 W. Lake Ave., #108B, Glenview, Ill. 60025
Zieroth, Lee W., 86–F Escondido Village, Stanford, Calif. 94305
Zitelli, William E., 302 Penn Lear Ct., Monroeville, Pa. 15146

United States Patent and Trademark Office Before the Commissioner of Patents and Trademarks

IN RE HERBERT DUBNO, RESPONDENT. PROCEEDINGS FOR SUSPENSION OR DISBARMENT

Final Order

Herbert Dubno of New York City, whose registration number is 19,752 is hereby suspended, beginning on June 15, 1977, from practicing before the United States Patent and Trademark Office, without prejudice to his reinstatement after five years and after compliance with the requirement of 37 CFR § 1.341.

This action is taken under the provisions of 35 U.S.C. § 32, 37 CFR § 1.348, and 37 CFR § 2.16.

C. MARSHALL DANN,
May 25, 1977. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,908,831, G. Hirsch, SPIT DRIVE UNITS, **filed** June 2, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c2042, *McGraw-Edison Company* v. *Beatrice Foods Co.* It is hereby stipulated, under F.R.C.P. Rule 41(a)(1)(ii), that the complaint and counterclaim in the above action be dismissed with prejudice, Mar. 1, 1977.

2,932,301, Schlaak and King, FOLDING STEP STOOL, **filed** Mar. 8, 1977, D.C., S.D. Ill. (Peoria) Doc. 77–1021, *Ever-Ready Appliance Manufacturing Company* v. *Hanson Scale Company, Inc.*

3,000,235, G. De Mestral, SEPARABLE FASTENING DEVICE, **filed** Feb. 28, 1977, D.C., W.D. Tenn. (Memphis) Doc. C-77-2133, *Actief, N.V.* v. *Comfort Care Products, Inc.*

3,056,836, H. D. Moed, ARALKYLAMINES AND METHODS OF PREPARATION THEREOF, **filed** Aug. 2, 1976, D.C., S.D.N.Y., Doc. 76-C-3324, *Mead Johnson & Company et ano.* v. *American Roland Corporation.* Consent judgment, defendant is permanently enjoined from further infringemet, and the above-captioned action is dismissed with prejudice, Jan. 14, 1977.

3,146,972, E. Engel, EMERGENCY CONTROL SYSTEM FOR AIRCRAFT, **filed** Aug. 30, 1976, D.C., S.D.N.Y., Doc. 76-C-3869, *Ervin Engel* v. *National Aeronautics and Space Administration et ano.* Memorandum, order of dismissal filed terminating above case, and complaint is dismissed in its entirety, Nov. 26, 1976.

3,545,154, Bobzin and Sawyer, SURFACE PANEL ASSEMBLY WITH RIGID STRIPS TO CONCEAL FASTENERS, **filed** Dec. 9, 1974, D.C., S.D. Mich. (Grand Rapids) Doc. 74-436, *The Celotex Corporation* v. *Bendix Homes Systems, Inc.* Notice of dismissal given by plaintiff, Mar. 2, 1977.

3,587,252, K. Kohl, COMBINED PRESSER AND GUIDE BAR MECHANISM FOR A WARP KNITTING MACHINE, **filed** Mar. 10, 1977, D.C., N.D. Ohio (Toledo) Doc. C77-119, *National-Standard Company* v. *Garbalizer Corporation of America.* **Same, filed** Mar. 10, 1977, D.C., N.D. Ohio (Toledo) Doc. C77-120, *J. Rush Snyder et al.* v. *Garbalizer Corporation of America.*

3,713,484, C. W. Gray, STRINGSHOT BACK-OFF TOOL, **filed** Mar. 9, 1977, D.C., E.D. La. (New Orleans) Doc. C.A. 77-751, *Claude W. Gray* v. *Edwards Rental & Fishing Tools, Inc.*

3,715,718, R. A. Astengo, GROUND PROXIMITY WARNING SYSTEM UTILIZING RADIO AND BAROMETRIC ALTIMETER COMBINATION, **filed** Mar. 9, 1977, D.C., W.D. Wash. (Seattle) Doc. C77-164S, *Sundstrand Data Control, Inc.* v. *Ralph A. Astengo.*

3,730,077, B. Selden, COLLAPSIBLE LAPBOARD STRUCTURE, **filed** Feb. 24, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-653-LTL, *Michele R. Selden* v. *Mark Distributors, Inc.*

3,740,980, Schimizzi and Schimizzi, AUTOMOBILE TRUNK LOCK MECHANISM (ANTI-THEFT DEVICE), **filed** Mar. 10, 1977, D.C., S.D.N.Y., Doc. 77-C-1169(MP), *Gregory Frank Schimizzi and Ernest Joseph Schimizzi* v. *Chrysler Corporation.*

3,789,210, Weber, Shroyer and Baker, RECESSED LIGHTED ASSIST BAR, **filed** Mar. 8, 1977, D.C., N.D. Ind. (South Bend) Doc. S77-0034, *Progressive Dynamics, Inc.* v. *ILC Products Company, Inc.*

3,821,830, J. J. Sundheim, CLEANER FOR CARPETS AND THE LIKE, **filed** Feb. 23, 1977, D.C. Colo. (Denver) Doc. 77-M-210, *Windsor Industries Inc.* v. *Burnside Equipment Ltd.*

3,822,707, Adducci and Schwalm, METAL-ENCLOSED PACER WITH SOLID-STATE POWER SOURCE, **filed** Mar. 11, 1977, D.C., W.D.N.Y. (Buffalo) Doc. 77-127, *Cardiac Pacemakers, Inc.* v. *Medtelectronics, Ltd.*

3,826,222, J. M. ROMICK, UNIT-DOSE MEDICATION HANDLING SYSTEM, **filed** Nov. 12, 1976, D.C., N.D. Ohio (Cleveland) Doc. C76-1202, *J. M. Romick* v. *Americare, Inc.* Stipulation and order dismissing action without prejudice, Mar. 10, 1977.

3,837,981, T. R. Flint, EPOXY TAPE, **filed** Oct. 6, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76-1657A, *Theodore R. Flint and Polymeric Systems, Inc.* v. *Dynatron Bondo Corporation.* Consent judgment, defendant is enjoined from use of said epoxy tape, Mar. 7, 1977.

3,844,000, J. Hedu, CLASP; **D. 200,155,** same, CLASP FASTENER OR SIMILAR ARTICLE, **filed** May 23, 1975, D.C.N.J. (Newark) Doc. 75-889, *The Siemon Company* v. *E-Z Buckle, Inc.* Action dismissed, May 23, 1975.

3,900,250, E. J. Ivani, SEMI-RIGID, GAS PERMEABLE CONTACT LENSES, **filed** Mar. 1, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-784-RJK, *Continuous Curve Contact Lenses, Inc.* v. *Rybci Scientific Corporation.*

3,902,584, Lee and Asbo, PAPER FEED SYSTEM FOR HIGH-SPEED PRINTER; **3,954,163,** A. Gabor, HIGH SPEED PRINTER WITH INTERMITTENT PRINT WHEEL AND CARRIAGE, **filed** May 7, 1976, D.C., N.D. Calif. (San Francisco) Doc. C76-934-GBH, *Xerox Corporation* v. *Qume Corporation and Sen Lin Lee (also known as David Lee).* Parties stipulated to a dismissal without prejudice, Nov. 12, 1976.

3,954,163. (See 3,902,584.)

3,999,748, W. A. Clarke, CHILDREN'S GAME OF CATCH, **filed** Mar. 2, 1977, D.C., W.D. Pa. (Erie) Doc. 77-28 Erie, *William A. Clarke* v. *G. A. Kayser & Sons, Inc. et al.*

4,009,497, J. R. Moon, WATER SAVING PANEL DEVICE FOR WATER CLOSETS, **filed** Mar. 2, 1977, D.C., M.D.N.C. (Greensboro) Doc. C77-108-D, *Moon Watersaver, Inc. and Watersavers, Inc.* v. *Fitch Lumber Company, Inc.* **Same, filed** Mar. 4, 1977, D.C., M.D.N.C. (Greensboro) Doc. 77-116-D, *Moon Watersavers, Inc. and Watersavers, Inc.* v. *Kerr Discount Drugs.*

D. 200,155. (See 3,844,000.)

D. 231,758, A. Rosselli, COUCH; **D. 231,759,** same, ARMCHAIR, **filed** Feb. 28, 1977, D.C., S.D. Fla. (Fort Lauderdale) Doc. 77-456-C-NCR, *Industria Arredamenti Fratelli Saporiti* v. *Carriage House Showrooms, Inc.*

D. 231,759. (See D. 231,758.)

D. 238,268, C. Strada, MOTORCYCLE EXHAUST PIPE, **filed** Mar. 3, 1977, D.C., E.D. Wis. (Milwaukee) Doc. 77-C-135, *Harley-Davidson Motor Co., Inc.* v. *Charles Strada.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,085,386, Re. S.N. 790,771, Filed Apr. 25, 1977, Cl. 56/25.4, ROTARY LAWNMOWER, Arthur J. Slemmons, Owner of Record: *Food Machinery and Chemical Corporation, San Jose, Calif.,* Attorney or Agent: F. W. Anderson, et al., Ex. Gp.: 333

3,569,747, Re. S.N. 790,055, Filed Apr. 22, 1977, Cl. 310/8.1, PIEZOELECTRIC TRANSDUCER, Vernon H. Siegel, Owner of Record: *Sundstrand Data Control, Inc., Redmond, Wash.,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 212

3,602,733, Re. S.N. 790,569, Filed Apr. 25, 1977, Cl. 307/209, THREE OUTPUT LEVEL LOGIC CIRCUIT, Edward M. Aoki, Owner of Record: *Signetics Corporation, Sunnyvale, Calif.,* Attorney or Agent: C. Richard Pfeiffer, et al., Ex. Gp.: 254

3,735,161, Re. S.N. 790,513, Filed Apr. 25, 1977, Cl. 310/9.5, PIEZOELECTRIC TRANSDUCER, George D. Perkins, et al., Owner of Record: *Bell & Howell Company, Pasadena, Calif.,* Attorney or Agent: Robert Berliner, Ex. Gp.: 212

3,789,711, Re. S.N. 789,336, Filed Apr. 20, 1977, Cl. 83/61, PUNCH PRESS DISCHARGE FEEDER, Dennis E. Mead, Owner of Record: *Lipe Rollway Corporation, Liverpool, N.Y.,* Attorney or Agent: Eugene S. Stephens, et al., Ex. Gp.: 324

3,810,453, Re. S.N. 789,191, Filed Apr. 20, 1977, Cl. 123/139 R, FUEL INJECTION SYSTEM, George D. Wolff, Owner of Record: *Inventor,* Attorney or Agent: John F. Learman, et al., Ex. Gp.: 342

3,880,313, Re. S.N. 790,681, Filed Apr. 25, 1977, Cl. 215/211, SAFETY CAP AND CONTAINER, Edward G. Akers, Owner of Record: *Inventor,* Attorney or Agent: Peter J. Murphy, Ex. Gp.: 241

3,880,633, Re. S.N. 791,737, Filed Apr. 28, 1977, Cl. 65/60, METHOD OF COATING A GLASS RIBBON ON A LIQUID FLOAT BATH, John F. Jordan, et al., Owner of Record: *Photon Power, Inc., Wilmington, Del.,* Attorney or Agent: Ronald L. Engel, et al., Ex. Gp.: 173

3,885,170, Re. S.N. 794,061, Filed May 5, 1977, Cl. 307/252 UA, METHOD FOR MOTOR CONTROL, Roman Kuzyk, Owner of Record: *Inventor,* Attorney or Agent: Martha G. Pugh, Ex. Gp.: 254

3,897,451, Re. S.N. 793,188, Filed May 2, 1977, Cl. 260/325 R, SYNTHESIS OF OXINDOLES FROM ANILINES AND INTERMEDIATES THEREIN, Paul G. Gassman, Owner of Record: *The Ohio State University Research Foundation, Columbus, Ohio,* Attorney or Agent: Gordon W. Hueschen, Ex. Gp.: 121

3,926,169, Re. S.N. 780,404, Filed Mar. 23, 1977, Cl. 123/32 SJ, COMBINED FUEL VAPOR INJECTOR AND IGNITER SYSTEM FOR INTERNAL COMBUSTION ENGINES, Ervin Leshner, et al., Owner of Record: *Fuel Injection Development Corporation, Palmyra, N.J.,* Attorney or Agent: Frederick W. Powers, III, et al., Ex. Gp.: 342

3,937,907, Re. S.N. 791,624, Filed Apr. 27, 1977, Cl. 179/170.6, DIGITAL ECHO SUPPRESSOR, Samuel Joseph Campanella, et al., Owner of Record: *Communications Satellite Corporation, Washington, D.C.,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 232

3,938,308, Re. S.N. 785,187, Filed Apr. 6, 1977, Cl. 57/52, METHOD AND DEVICE FOR TRANSFERRING FRESH BOBBINS FROM A BOBBIN SUPPLY DEVICE TO A CONVEYER BELT OF A TEXTILE MACHINE, Ikuo Komura, et al., Owner of Record: *Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan,* Attorney or Agent: Milton J. Wayne, Ex. Gp.: 244

3,970,331, Re. S.N. 792,028, Filed Apr. 28, 1977, Cl. 281/21 R, BINDER ELEMENT, Joe D. Giulie, Owner of Record: *Minnesota Mining and Manufacturing Company, St. Paul, Minn.,* Attorney or Agent: Cruzan Alexander, et al., Ex. Gp.: 334

3,974,707, Re. S.N. 793,366, Filed May 3, 1977, Cl. 74/217 B, DERAILLEUR FOR A BICYCLE, Masashi Nagano, Owner of Record: *Shimano Industrial Company, Limited, Japan,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 345

3,998,494, Re. S.N. 792,031, Filed Apr. 28, 1977, Cl. 301/37 P, WHEEL AND GREASE CAP ASSEMBLY, Edward G. Spisak, Owner of Record: *Inventor,* Attorney or Agent: Hugh L. Fisher, et al., Ex. Gp.: 311

4,014,215, Re. S.N. 789,794, Filed Apr. 22, 1977, Cl. 73/371, CLINICAL GLASS THERMOMETER HAVING A STEM AND A BULB INTEGRALLY FORMED THEREWITH, Seymour N. Blackman, Owner of Record: *Inventor,* Attorney or Agent: David B. Kirschstein, et al., Ex. Gp.: 244

PATENT NOTICES

Certificates of Correction for the Week of June 21, 1977

P.P. 4,010	3,986,826	4,004,173	4,014,364
Re. 29,156	3,986,969	4,004,421	4,014,405
D. 243,686	3,987,350	4,004,455	4,014,779
3,861,889	3,987,762	4,004,635	4,014,871
3,880,837	3,988,599	4,005,493	4,014,881
3,886,226	3,989,857	4,005,913	4,014,885
3,887,500	3,990,774	4,006,060	4,014,896
3,888,980	3,992,335	4,006,174	4,014,999
3,894,871	3,992,808	4,006,515	4,015,025
3,902,393	3,993,803	4,007,123	4,015,053
3,906,765	3,995,013	4,007,124	4,015,207
3,910,347	3,995,119	4,007,291	4,015,498
3,918,013	3,995,200	4,007,593	4,015,612
3,947,763	3,997,216	4,008,363	4,015,694
3,953,970	3,997,585	4,008,813	4,015,734
3,954,749	3,997,770	4,009,073	4,015,969
3,956,309	3,999,027	4,009,514	4,016,161
3,956,628	4,000,119	4,009,696	4,016,169
3,957,864	4,000,548	4,010,164	4,016,655
3,962,741	4,001,105	4,010,450	4,016,708
3,967,305	4,001,357	4,011,567	4,017,009
3,968,870	4,001,379	4,011,944	4,017,219
3,972,375	4,001,990	4,012,026	4,018,239
3,975,709	4,002,176	4,012,155	4,018,333
3,976,125	4,002,435	4,012,323	4,018,341
3,976,248	4,002,442	4,012,540	4,018,427
3,976,436	4,002,587	4,013,307	4,018,558
3,982,550	4,002,662	4,013,486	4,018,650
3,984,519	4,003,747	4,014,288	

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for U.S. and possibly foreign licensing, in accordance with the policies of the agency sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications, either paper copy (PC) or microfiche (MF), can be purchased at the prices cited from the National Technical Information Service (NTIS), Springfield, Virginia 22161. Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 684,429. Fluidic Oscillating Jet for High Frequency Gust Tunnel. Filed May 7, 1976. PC $3.50/MF $3.00.

Patent 3,956,015. Lightweight Nickel Hydrogen Cell. Filed June 6, 1975. Patented May 11, 1976. Not available NTIS.

Patent 3,958,119. Method and Device for Evaluating Penetrants. Filed Aug. 5, 1974. Patented May 18, 1976. Not available NTIS.

Patent 3,959,740. Quartz Wedge Polarizer for an Electro Optic Switch. Filed Feb. 6, 1975. Patented May 25, 1976. Not available NTIS.

Patent 3,963,196. Aircraft/Spacecraft Ground Accelerator. Filed June 12, 1974. Patented June 15, 1976. Not available NTIS.

Patent 3,963,911. Hybrid Sample Data Filter. Filed Apr. 22, 1975. Patented June 15, 1976. Not available NTIS.

Patent 3,965,462. Serpentine Charge-Coupled-Device Memory Circuit. Filed May 9, 1975. Patented June 22, 1976. Not available NTIS.

Patent 3,966,160. Inflight Intravenous Bottle Holder. Filed May 12, 1975. Patented June 29, 1976. Not available NTIS.

Patent 3,966,729. Addition Curable Phenyl-Quinoxaline Compositions and Their Synthesis. Filed May 19, 1975. Patented June 29, 1976. Not available NTIS.

Patent 3,966,855. Method of Fabricating Silicon Carbide Articles. Filed Feb. 22, 1974. Patented June 29, 1976. Not available NTIS.

Patent 3,967,102. Self-Adjusting Digital Notch Filter. Filed Mar. 25, 1975. Patented June 29, 1976. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agriculture Research Service, Hyattsville, Md. 20782

Patent application 686,423. Continuous Mechanized Harvesting of Horticultural Crops. Filed May 14, 1976. PC $3.50/MF $3.00.

Patent application 686,424. Metering and Spray Apparatus for Horticultural Applications. Filed May 14, 1976. PC $3.50/MF $3.00.

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th St., SW.
Washington, D.C. 20590

Patent 3,975,736. Radio Theodolite Angle Measuring Apparatus. Filed Feb. 11, 1975. Patented Aug. 17, 1976. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

Patent application 698,688. Powered Wheel Chair. Filed June 22, 1976. PC $3.50/MF $3.00.

Patent application 698,689. Synthesis of Daunosamine Hydrochloride From a D-Mannose Starting Material. Filed June 22, 1976. PC $3.50/MF $3.00.

Patent application 699,996. Ultrasonic Transducer Calibration. Filed June 25, 1976. PC $3.50/MF $3.00.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 461,834. Optical Temperature Probe. Filed Apr. 18, 1974. PC $3.50/MF $3.00.

Patent application 464,604. Apparatus for Collecting Deep-Sea Sediment Pore Water. Filed Apr. 26, 1974. PC $3.50/MF $3.00.

Patent application 576,923. Electrochemical Formation of Graphite Intercalation Compounds for Storage Batteries. Filed May 12, 1975. PC $3.50/MF $3.00.

Patent application 622,285. Broadband Millimeter Wave Amplifier. Filed Oct. 10, 1974. PC $3.50/MF $3.00.

Patent application 674,356. Memory Wire and Synchronous Plating Techniques Therefore. Filed Apr. 7, 1976. PC $3.50/MF $3.00.

Patent application 677,944. A Digital Flow Control System. Filed Apr. 26, 1976. PC $3.50/MF $3.00.

Patent application 680,013. Fluid Fill or Bleed Apparatus. Filed Apr. 23, 1976. PC $3.50/MF $3.00.

Patent application 683,996. Mechanical-Chemical Linkage Between Polymer Layers. Filed May 6, 1976. PC $3.50/MF $3.00.

Patent application 686,855. Multifrequency Array Using Common Phasors. Filed May 17, 1976. PC $3.50/MF $3.00.

Patent application 689,015. Microscope. Filed May 24, 1976. PC $3.50/MF $3.00.

Patent application 689,692. Toxic Gas Control for RF Absorber Fires. Filed May 24, 1976. PC $3.50/MF $3.00.

Patent application 689,891. Scuttling Valve. Filed May 25, 1976. PC $3.50/MF $3.00.

Patent application 690,699. Acoustic Surface Wave Device. Filed May 27, 1976. PC $3.50/MF $3.00.

Patent application 691,122. Reducing Electrostatic Hazard of CO_2 Fire Extinguishers. Filed May 28, 1976. PC $3.50/MF $3.00.

Patent application 691,753. A Connector for Coupling Multi-Filament Fiber Optic Cables. Filed June 1, 1976. PC $3.50/MF $3.00.

Patent application 693,592. Electric Discharge Gasdynamic Laser. Filed June 7, 1976. PC $3.50/MF $3.00.

Patent application 693,808. Ferroelectric Crystals Having Tailored Domain Patterns. Filed June 7, 1976. PC $4.00/MF $3.00.

Patent application 695,296. Ceramic Compositions. Filed June 11, 1976. PC $3.50/MF $3.00.

Patent application 695,298. Compact Three-Beam Interferometer. Filed June 11, 1976. PC $3.50/MF $3.00.

Patent application 695,614. Self Learning Monitor for VLF Wave Propagation. Filed June 14, 1976. PC $3.50/MF $3.00.

Patent application 696,238. Vinyl Polymerization Initiator and Reducing Agent. Filed June 15, 1976. PC $3.50/MF $3.00.

Patent application 700,279. Composite for Improved Stripline Board Material. Filed June 28, 1976. PC $3.50/MF $3.00.

Patent application 700,683. An Electro Optic Binary Adder. Filed June 28, 1976. PC $3.50/MF $3.00.

Patent application 701,467. Fiber Optic Cable Connector. Filed July 1, 1976. PC $3.50/MF $3.00.

Patent application 702,377. Double-Layer Oxide Gate Insulators for Field-Effect Transistors. Filed July 2, 1976. PC $3.50/MF $3.00.

Patent 3,896,328. Dual Mode CRT Screen. Filed May 28, 1974. Patented July 22, 1975. Not available NTIS.

Patent 3,898,984. Ambulatory Patient Monitoring System. Filed Feb. 4, 1974. Patented Aug. 12, 1975. Not available NTIS.

Patent 3,910,218. Propellant-Actuated Deep Water Anchor. Filed Feb. 4, 1974. Patented Oct. 7, 1975. Not available NTIS.

Patent 3,922,063. Winch Mounted Optical Data Transmission Cable With Fluid Coupling. Filed Aug. 29, 1974. Patented Nov. 25, 1975. Not available NTIS.

Patent 3,931,392. Enhancement of Ultimate Tensile Strength of Carbon Fibers. Filed Jan. 10, 1974. Patented Jan. 6, 1976. Not available NTIS.

Patent 3,933,390. Attachment Devices for Underwater Salvage. Filed May 22, 1974. Patented Jan. 20, 1976. Not available NTIS.

Patent 3,937,942. Multi-Channel Optical Correlation System. Filed July 1, 1974. Patented Feb. 10, 1976. Not available NTIS.

Patent 3,945,920. Coanda Effect Oil-Water Separator. Filed Oct. 3, 1974. Patented Mar. 23, 1976. Not available NTIS.

Patent 3,947,850. Notch Fed Electric Microstrip Dipole Antenna. Filed Apr. 24, 1975. Patented Mar. 30, 1976. Not available NTIS.

Patent 3,952,505. High Performance Ramjet Fuels. Filed July 26, 1974. Patented Apr. 27, 1976. Not available NTIS.

Patent 3,954,015. Method of Determining Piezoelectric Constants of Ceramic Rings. Filed July 17, 1975. Patented May 4, 1976. Not available NTIS.

Patent 3,954,323. Optical Waveguide Linear Modulator Array. Filed Mar. 23, 1973. Patented May 4, 1976. Not available NTIS.

Patent 3,956,706. Miniaturized Millimeter Wave Instantaneous Frequency Discriminator. Filed Feb. 3, 1975. Patented May 11, 1976. Not available NTIS.

Patent 3,957,296. Vacuum Multiplier. Filed May 5, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,957,672. Displacement of Organic Liquid Films From Solid Surfaces by Non Aqueous Systems. Filed Nov. 23, 1973. Patented May 18, 1976. Not available NTIS.

Patent 3,958,109. Universal Modularized Digital Controller. Filed Jan. 20, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,958,189. Stimulated Coherent Cyclotron Scattering, Millimeter, and Submillimeter Wave Generator. Filed June 4, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,958,214. Encoded Echo-Ranging Signal Generator. Filed July 19, 1963. Patented May 18, 1976. Not available NTIS.

Patent 3,958,243. Circuit for Generating a Digital or Analog Signal as a Function of Doppler Frequency. Filed Mar. 20, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,958,858. Modified Circuit Card Extender. Filed Sept. 10, 1975. Patented May 25, 1976. Not available NTIS.

Patent 3,959,127. Biodegradation of Oil on Water Surfaces. Filed Mar. 13, 1975. Patented May 25, 1976. Not available NTIS.

Patent 3,959,582. Solid State Electronically Rotatable Raster Scan for Television Cameras. Filed Mar. 31, 1975. Patented May 25, 1976. Not available NTIS.

Patent 3,959,665. Logic Circuits With Interfacing System. Filed May 29, 1974. Patented May 25, 1976. Not available NTIS.

Patent 3,960,100. Pressurized Ship Structure for Slamming Loads. Filed June 2, 1975. Patented June 1, 1976. Not available NTIS.

Patent 3,961,274. Noise Riding Threshold. Filed Mar. 10, 1975. Patented June 1, 1976. Not available NTIS.

Patent 3,961,282. Tracking Status Detector for a Digital Delay Lock Loop. Filed Apr. 28, 1975. Patented June 1, 1976. Not available NTIS.

Patent 3,961,291. Apparatus and Method for Mapping Acoustic Fields. Filed Nov. 29, 1974. Patented June 1, 1976. Not available NTIS.

Patent 3,962,672. Tethered Vehicle Location System. Filed July 16, 1975. Patented June 8, 1976. Not available NTIS.

Patent 3,962,697. Low Level Bio-Telemetry System Using C/MOS Multiplexing. Filed June 16, 1975. Patented June 8, 1976. Not available NTIS.

Patent 3,963,198. Negative Air Cushion for Airship Ground Handling. Filed Apr. 2, 1975. Patented June 15, 1976. Not available NTIS.

Patent 3,963,308. Focusing Coupling Device for Multi-Optical-Fiber Cable. Filed June 25, 1973. Patented June 15, 1976. Not available NTIS.

Patent 3,964,013. Cavitating Parametric Underwater Acoustic Source. Filed Oct. 22, 1974. Patented June 15, 1976. Not available NTIS.

Patent 3,965,402. Headrest Proportional Control for Motorized Wheelchair. Filed July 1, 1974. Patented June 22, 1976. Not available NTIS.

Patent 3,967,224. Coated Magnetically Biased Reed Switch. Filed Apr. 25, 1975. Patented June 29, 1976. Not available NTIS.

Patent 3,968,399. Method for Driving a LED at High Speed. Filed Mar. 19, 1975. Patented July 6, 1976. Not available NTIS.

Patent 3,968,455. Injection Laser With Integral Modulator. Filed Mar. 5, 1974. Patented July 6, 1976. Not available NTIS.

Patent 3,969,925. In Situ Oceanographic Sample Separator. Filed Sept. 16, 1975. Patented July 20, 1975. Not available NTIS.

Patent 3,970,156. Water Weighted Corer. Filed Sept. 15, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,970,833. High-Speed Adder. Filed June 18, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,970,855. Positron Probes for Mechanical Fatigue Detection System. Filed May 23, 1975. Patented July 20, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent 3,965,428. Spectrum-Shape Discrimination On/Off Target Indicator. Filed Jan. 4, 1971. Patented June 22, 1976. Not available NTIS.

Patent 3,965,470. Pulse Analyzer for an RF Moving Target Detector. Filed Dec. 13, 1972. Patented June 22, 1976. Not available NTIS.

Patent 3,965,471. Radiation Detection System. Filed Aug. 13, 1969. Patented June 22, 1976. Not available NTIS.

Patent 3,965,821. Low Spin-Deceleration Safing and Arming Mechanism. Filed Jan. 16, 1975. Patented June 29, 1976. Not available NTIS.

Patent 3,966,146. Air Bladder Seat Cushion for High Acceleration Cockpit. Filed Mar. 10, 1975. Patented June 29, 1976. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agriculture Research Service, Hyattsville, Md. 20782

Patent application 706,980. Method for Insolubilizing Enzymes on Chitosan. Filed July 19, 1976. PC $3.50/MF $3.00.

Patent application 708,792. Highly Absorbent Polymeric Compositions Derived From Flour. Filed July 26, 1976. PC $3.50/MF $3.00.

Patent application 714,229. Method of Peeling Fruits and Vegetables With Carboxylic Acids. Filed Aug. 13, 1976. PC $3.50/MF $3.00.

Patent 3,968,254. Method of Preparing Feed Grain Compositions. Filed June 23, 1975. Patented July 6, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th & C Sts., NW
Washington, D.C. 20240

Patent 3,898,042. Method and Apparatus for Continuously Determining Total Copper in an Aqueous Stream. Filed Jan. 2, 1974. Patented Aug. 5, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 543,745. Transient Event Data Acquisition Apparatus for Use With Radar Systems and the Like. Filed Jan. 24, 1975. PC $3.50/MF $3.00.

Patent application 587,171. Constant False Alarm Rate (CFAR) Circuitry for Minimizing Extraneous Target Sensitivity. Filed June 16, 1975. PC $3.50/MF $3.00.

Patent application 587,173. Injection-Molding Apparatus for Attaching End Fittings to Detonating Cords. Filed June 16, 1975. PC $3.50/MF $3.00.

Patent application 589,482. Booster Apparatus for Augmenting Side Initiation of Explosive Cords. Filed June 23, 1975. PC $3.50/MF $3.00.

Patent application 642,926. Electrical Field Sensing and Transmitting Apparatus. Filed Dec. 22, 1975. PC $3.50/MF $3.00.

Patent application 643,047. Multi-Path Signal Enhancing Apparatus. Filed Dec. 22, 1975. PC $3.50/MF $3.00.

Patent application 683,997. A Non-Tumbling Limit Stop Providing a Mechanical Super Cage. Filed May 6, 1976. PC $3.50/MF $3.00.

Patent application 697,514. Parallel/Time-Shared Variable Time Delay Generator With Common Timing Control and Fast Recovery. Filed June 18, 1976. PC $3.50/MF $3.00.

Patent 3,958,157. Oil Level Detection Circuit. Filed Feb. 12, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,958,241. Chaff Discrimination System. Filed Nov. 2, 1961. Patented May 18, 1976. Not available NTIS.

Patent 3,958,780. Convertible Canopy-to-Wing Shaped Parachute. Filed Apr. 9, 1975. Patented May 25, 1976. Not available NTIS.

Patent 3,961,304. Decoupled Hydrophone With Reduced Response to Vibration and Stress Concentration. Filed Oct. 21, 1974. Patented June 1, 1976. Not available NTIS.

Patent 3,961,305. Fluid for Filling Sonar Transducers. Filed Feb. 14, 1975. Patented June 1, 1976. Not available NTIS.

Patent 3,961,520. Apparatus for Mechanically Exercising Bourdon Tube Gauge. Filed May 27, 1975. Patented June 8, 1976. Not available NTIS.

Patent 3,968,455. Injecting Laser With Integral Modulator. Filed Mar. 5, 1974. Patented July 6, 1976. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters NASA—Code GP–2, Washington, D.C. 20546

Patent application 691,647. A Logic-Controlled Occlusive Cuff System. Filed June 1, 1976. PC $3.50/MF $3.00.

Patent application 692,413. Extraction and Separation of a Preferentially Photo-Dissociated Molecular Isotope Into Positive and Negative Ions by Means of an Electric Field. Filed June 3, 1976. PC $3.50/MF $3.00.

Patent 3,964,306. System for Measuring Reynolds in a Turbulently Flowing Fluid. Patented June 22, 1976. Not available NTIS.

Patent 3,964,319. Instrumentation for Measuring Aircraft Noise and Sonic Boom. Patented June 22, 1976. Not available NTIS.

Patent 3,964,813. Connector. Patented June 22, 1976. Not available NTIS.

Patent 3,964,902. Method of Forming a Wick for a Heat Pipe. Patented June 22, 1976. Not available NTIS.

Patent 3,964,928. Lead-Oxygen DC Power Supply System Having a Closed Loop Oxygen and Water System. Patented June 22, 1976. Not available NTIS.

Patent 3,965,354. Resistive Anode Image Converter. Patented June 22, 1976. Not available NTIS.

Patent 3,965,475. Switchable Beamwidth Monopulse Method and System. Patented June 22, 1976. Not available NTIS.

Patent 3,966,547. Method of Producing I–123. Patented June 29, 1976. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agriculture Research Service, Hyattsville, Md. 20782

Patent 3,771,348. Analog Flueric Gas Concentration Sensor. Filed Feb. 28, 1972. Patented Nov. 13, 1973. Not available NTIS.

Patent 3,915,645. Chemical Reaction Transducers for Use With Flueric Gas Concentration Sensing Systems. Filed Apr. 24, 1973. Patented Oct. 28, 1975. Not available NTIS.

Patent 3,922,608. Electromagnetic Interference Locator. Filed Nov. 29, 1973. Patented Nov. 25, 1975. Not available NTIS.

Patent 3,925,315. Diglicidyl Ether of 4-Methylol Resorcinol. Filed Sept. 20, 1974. Patented Dec. 9, 1975. Not available NTIS.

Patent 3,926,221. Laminar Fluidic Multiplier. Filed Aug. 14, 1974. Patented Dec. 16, 1975. Not available NTIS.

Patent 3,928,076. LiCl Inhibitor for Perchlorate Battery. Filed Sept. 13, 1974. Patented Dec. 23, 1975. Not available NTIS.

Patent 3,928,112. Process for Producing Stabilized Anatase Titanium Dioxide Surfaces for Durable Adhesive Bonding. Filed Jan. 4, 1974. Patented Dec. 23, 1975. Not available NTIS.

Patent 3,929,717. Alcohol Sensitive Repairable Epoxy Embedding Material. Filed June 28, 1974. Patented Dec. 30, 1975. Not available NTIS.

Patent 3,930,317. Electronic Azimuth Transfer Method and System. Filed May 10, 1974. Patented Jan. 6, 1976. Not available NTIS.

Patent 3,930,519. Pressure Regulator. Filed Feb. 13, 1975. Patented Jan. 6, 1976. Not available NTIS.

Patent 3,930,541. Flame Prevention System for Fuel Tank Fires. Filed Oct. 22, 1974. Patented Jan. 6, 1976. Not available NTIS.

Patent 3,930,550. Vehicle Drive and Suspension. Filed Aug. 15, 1974. Patented Jan. 6, 1976. Not available NTIS.

Patent 3,930,553. Track Tension Control. Filed Nov. 22, 1974. Patented Jan. 6, 1976. Not available NTIS.

Patent 3,941,345. Radial Arm Guidance Platform Tracker. Filed Nov. 28, 1973. Patented Mar. 2, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 696,342. Probe System for Wind Tunnel Test Section. Filed June 15, 1976. PC $3.50/MF $3.00.

Patent 3,970,006. Protective Cover for a Missile Nose Cone. Filed Jan. 16, 1975. Patented July 20, 1975. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agriculture Research Service, Hyattsville, Md. 20782

Patent application 712,298. Insolubilization of Enzymes on Modified Phenolic Polymers. Filed Aug. 8, 1976. PC $3.50/MF $3.00.

Patent 3,972,897. Mosquito Larvicide. Filed Oct. 30, 1975. Patented Aug. 3, 1976. Not available NTIS.

Patent 3,972,918. Process for Separating DOPA From Tyrosine. Filed June 28, 1974. Patented Aug. 3, 1976. Not available NTIS.

Patent 3,975,270. Process for Recovering Usable Olive-Processing Liquor From Olive-Processing Waste Solution. Filed Dec. 3, 1975. Patented Aug. 17, 1976. Not available NTIS.

Patent 3,976,552. Water-Soluble Graft Polymers Produced by an Outwardly Dry Radiation Polymerization Process. Filed Aug. 13, 1975. Patented Aug. 24, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th & C Sts., NW
Washington, D.C. 20240

Patent application 702,262. Production of Alumina Monohydrate From Aluminum Nitrate Solutions. Filed July 2, 1976. PC $3.50/MF $3.00.

Patent application 707,973. Method for Producing Raney Type Catalyst. Filed July 23, 1976. PC $3.50/MF $3.00.

Patent application 713,452. Spectrally Selective Solar Absorbers. Filed Aug. 11, 1976. PC $3.50/MF $3.00.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 458,927. Suspension System for Directional Hydrophones. Filed Apr. 1, 1974. PC $3.50/MF $3.00.

Patent 3,970,862. Polymeric Sensor of Vibration and Dynamic Pressure. Filed June 25, 1974. Patented July 20, 1976. Not available NTIS.

Patent 3,970,952. Broadband Output Circuit for Klystron Amplifier. Filed May 15, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,970,965. Injection Locked Josephson Oscillator Systems. Filed Mar. 26, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,971,057. Lateral Photodetector of Improved Sensitivity. Filed Aug. 21, 1973. Patented July 20, 1976. Not available NTIS.

Patent 3,971,068. Image Processing System. Filed Aug. 22, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,971,939. Unitary Laser/IR Seeker. Filed Aug. 19, 1975. Patented July 27, 1976. Not available NTIS.

Patent 3,973,263. Sensitivity Improvement of Spaced-Loop Antenna by Capacitive Gap Loading. Filed Apr. 20, 1973. Patented Aug. 3, 1976. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters NASA—Code GP–2, Washington, D.C. 20546

Patent application 692,413. Extraction and Separation of a Preferentially Photo-Dissociated Molecular Isotope Into Positive and Negative Ions by Means of an Electric Field. Filed June 3, 1976. PC $3.50/MF $3.00.

Patent 3,967,091. Capillary Flow Weld-Bonding. Patented June 29, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 685,210. Jet Engine Tail Pipe Flow Deflector. Filed May 11, 1976. PC $3.50/MF $3.00.

Patent application 685,247. Vortex Flow Particle Accelerator. Filed May 11, 1976. PC $5.50/MF $3.00.

Patent 3,957,206. Extendable Rocket Motor Exhaust Nozzle. Filed Jan. 27, 1975. Patented May 18, 1976. Not available

U.S. DEPARTMENT OF TRANSPORTATION
Patent Counsel, 400 7th St., SW.
Washington, D.C. 20590

Patent application 713,906. Critical Coordination Tester. Filed Aug. 12, 1976. PC $3.50/MF $3.00.

Patent application 715,424. Road-Runner Alcohol Safety Interlock System. Filed Aug. 18, 1976. PC $3.50/MF $3.00.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

Patent application 557,183. Method for the Preparation of Oxygenated Benzo(c)Phenanthridine Compounds. Filed Mar. 10, 1975. PC $4.00/MF $3.00.

Patent application 692,915. Synthesis of 2-Alkanoylamino-4-Nitrophenyl Phosphorylcholine-Hydroxide. Filed June 4, 1976. PC $3.50/MF $3.00.

Patent 3,956,895. Heat Engine. Filed Oct. 10, 1974. Patented May 18, 1976. Not available NTIS.

Patent 3,962,040. Method and Apparatus for Plating and Counting Aerobic Bacteria. Filed Jan. 28, 1975. Patented June 8, 1976. Not available NTIS.

Patent 3,965,868. Laboratory Mouse Feeder. Filed Apr. 14, 1975. Patented June 29, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research—Code 302, Arlington, Va. 22217

Patent application 625,360. A Multiple Channel Decommutator Accumulator. Filed Oct. 22, 1976. PC $3.50/MF $3.00.

Patent application 651,876. High Accuracy Sweep Oscillator System. Filed Jan. 23, 1976. PC $3.50/MF $3.00.

Patent application 652,034. A System for Vapor Cooling Electronic Equipment. Filed Jan. 26, 1976. PC $3.50/MF $3.00.

Patent application 652,036. Saturating Transformer Inverter Circuit. Filed Jan. 16, 1976. PC $3.50/MF $3.00.

Patent application 652,919. Selective Zoom Camera and Display. Filed Jan. 28, 1976. PC $3.50/MF $3.00.

Patent application 656,775. Laser System Having Frequency Doubling. Filed Feb. 9, 1976. PC $3.50/MF $3.00.

Patent application 661,479. Isolation Amplifier for Resistive and Inductive Loads. Filed Feb. 26, 1976. PC $3.50/MF $3.00.

Patent application 662,659. Phase-Locking Mid-Pulse Detector. Filed Mar. 1, 1976. PC $3.50/MF $3.00.

Patent application 670,281. Integrated Cooling and Breathing System. Filed Mar. 25, 1976. PC $3.50/MF $3.00.

Patent application 672,107. Carrier-Compatible Chirp-Z Transform Device. Filed Mar. 31, 1976. PC $4.00/MF $3.00.

Patent application 672,579. In-Situ Lapping Apparatus for Gate Valves. Filed Apr. 1, 1976. PC $3.50/MF $3.00.

Patent application 679,629. Amplifier for Fiber Optics Application. Filed Apr. 23, 1976. PC $3.50/MF $3.00.

Patent 3,808,833. Compact Transpiration Cooling System. Filed Apr. 3, 1973. Patented May 7, 1974. Not available NTIS.

Patent 3,916,262. Low Voltage Bus-Operated Overvoltage Protection System. Filed July 23, 1974. Patented Oct. 28, 1975. Not available NTIS.

Patent 3,939,480. Level and Cross-Level Stabilization Technique for Search Radar Antennas. Filed Sept. 17, 1974. Patented Feb. 17, 1976. Not available NTIS.

Patent 3,940,443. Fuel-Air Explosive Bomblet. Filed July 14, 1965. Patented Feb. 24, 1976. Not available NTIS.

Patent 3,940,602. Signal Processing Imager Array Using Charge Transfer Concepts. Filed Sept. 23, 1974. Patented Feb. 24, 1976. Not available NTIS.

Patent 3,940,713. Stimulated Brillouin Scattered (SBS) Tuned Laser. Filed Nov. 11, 1974. Patented Feb. 24, 1976. Not available NTIS.

Patent 3,941,354. Anti Two-Blocking Device. Filed Feb. 25, 1975. Patented Mar. 2, 1976. Not available NTIS.

Patent 3,941,482. Method of Testing Alkali Halide Crystals With Anisotropic Centers. Filed Feb. 25, 1975. Patented Mar. 2, 1976. Not available NTIS.

Patent 3,942,444. Variable Energy Explosive Driver. Filed Sept. 3, 1974. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,942,890. Secure Active Sensor. Filed Mar. 21, 1974. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,943,196. Alkoxy Derivatives of the Adduct From Phosphorus Oxychloride and Hexamethylphosphoramide. Filed June 19, 1974. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,943,197. Alkoxy Derivatives of the Adduct From Phosphorous Pentachloride and Hexamethylphosphoramide. Filed June 19, 1974. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,943,457. Optical Pulse Compression and Shaping System. Filed Oct. 16, 1974. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,943,465. Dual Field Excitation for a Carbon Dioxide Laser. Filed Mar. 21, 1974. Patented Mar. 9, 1976. Not available NTIS.

Patent 3,943,708. Two Area Rocket Nozzle. Filed Nov. 26, 1973. Patented Mar. 16, 1976. Not available NTIS.

Patent 3,944,820. High Speed Optical Matrix Multiplier System. Filed May 12, 1975. Patented Mar. 16, 1976. Not available NTIS.

Patent 3,945,716. Rotatable Head Up Display With Coordinate Reversal Correctives. Filed Dec. 20, 1974. Patented Mar. 23, 1976. Not available NTIS.

Patent 3,947,706. Voltage and Temperature Compensated Linear Rectifier. Filed Apr. 30, 1975. Patented Mar. 30, 1976. Not available NTIS.

Patent 3,949,605. Acoustic Current/Flow Measuring System. Filed July 2, 1974. Patented Apr. 13, 1976. Not available NTIS.

Patent 3,950,462. Method for Making a Resilient Storage Insert. Filed June 19, 1975. Patented Apr. 13, 1976. Not available NTIS.

Patent 3,950,703. Microcircuit Reverse-Phased Hybrid Ring Mixer. Filed Feb. 3, 1975. Patented Apr. 13, 1976. Not available NTIS.

Patent 3,950,704. Video Retimer System. Filed Sept. 12, 1974. Patented Apr. 13, 1976. Not available NTIS.

Patent 3,951,072. Propellant Grain. Filed Sept. 12, 1968. Patented Apr. 20, 1976. Not available NTIS.

Patent 3,951,515. Fiber Optic Hull Penetrator With High Channel Density. Filed June 20, 1975. Patented Apr. 20, 1976. Not available NTIS.

Patent 3,952,664. Rocket Nozzle Multi Function. Filed June 10, 1974. Patented Apr. 27, 1976. Not available NTIS.

Patent 3,954,063. Novel Inhibitor System for Double-Base Propellant. Filed Dec. 9, 1974. Patented May 4, 1976. Not available NTIS.

Patent 3,958,194. Frequency-Sensitive Attenuator. Filed Jan. 3, 1975. Patented May 18, 1976. Not available NTIS.

Patent 3,959,671. High Current Pulser Circuit. Filed June 20, 1975. Patented May 25, 1976. Not available NTIS.

Patent 3,959,785. Radiation Hardened Plated Wire for Memory. Filed Jan. 23, 1975. Patented May 25, 1976. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters NASA—Code GP–2, Washington, D.C. 20546

Patent application 616,528. Bearing Material. Filed Sept. 25, 1975. PC $4.00/MF $3.00.

Patent application 623,156. Magnetic Heading References. Filed Oct. 16, 1975. PC $3.50/MF $3.00.

Patent application 636,193. Method and Means for Testing a Glancing-Incidence Mirror System. Filed Nov. 10, 1975. PC $3.50/MF $3.00.

Patent application 666,992. Aldehyde-Containing Urea-Absorbing Polysaccharides. Filed Mar. 15, 1976. PC $3.50/MF $3.00.

Patent application 674,194. Graphite Reinforced Bone Cement. Filed 1976. PC $3.50/MF $3.00.

Patent application 674,700. Oil and Fat Absorbing Polymers. Filed Apr. 7, 1976. PC $3.50/MF $3.00.

Patent application 676,351. Photoelectron Spectrometer With Means for Stabilizing Sample Surface Potential. Filed Apr. 9, 1976. PC $3.50/MF $3.00.

Patent application 677,351. Direct Reading Inductance Meter. Filed Apr. 15, 1976. PC $3.50/MF $3.00.

Patent application 680,939. Portable, Linear-Focused Solar Thermal Energy Collecting System. Filed Apr. 28, 1976. PC $3.50/MF $3.00.

Patent application 681,096. A Solar Energy Collection System. Filed Apr. 28, 1976. PC $3.50/MF $3.00.

Patent application 684,809. Method and Apparatus for Automatic Load Sharing Among Paralleled Converters. Filed May 10, 1976. PC $3.50/MF $3.00.

Patent application 688,852. RF Beam Center Location Method and Apparatus for Power Transmission System. Filed May 21, 1976. PC $3.50/MF $3.00.

Patent application 688,853. Method of Inhibiting Maillard Reaction Browning in Food Products. Filed May 21, 1976. PC $3.50/MF $3.00.

Patent application 688,854. Regenerable Device for Scrubbing Breathable Air of CO_2 and Moisture Without Special Heat Exchanger Equipment. Filed May 21, 1976. PC $3.50/MF $3.00.

Patent application 688,855. Regenerable Device for Scrubbing Breathable Air of CO_2 and Moisture Without Special Heat Exchanger Equipment. Filed May 21, 1976. PC $3.50/MF $3.00.

Patent application 688,856. A Condition Sensor System and Method. Filed May 21, 1976. PC $3.50/MF $3.00.

Patent application 688,879. Extreme Temperature Thermal Control Coating. Filed May 21, 1976. PC $3.50/MF $3.00.

Patent application 690,816. Fluid Valve Assembly. Filed May 27, 1976. PC $3.50/MF $3.00.

Patent application 691,256. Real Time Reflectometer. Filed May 28, 1976. PC $3.50/MF $3.00.

Patent application 692,414. Unbalanced Quadriphase Demodulator. Filed June 3, 1976. PC $3.50/MF $3.00.

Patent application 693,074. Improved Low Cost Substrates for Polycrystalline Solar Cells. Filed June 4, 1976. PC $4.00/MF $3.00.

Patent application 694,402. Schlieren System Employing Antiparallel Reflector in the Forward Direction. Filed June 9, 1976. PC $3.50/MF $3.00.

Patent application 694,406. Method of Post-Process Intensification of Images on Photographic Films and Plates. Filed June 9, 1976. PC $3.50/MF $3.00.

Patent application 696,989. Method of Preparing Zinc Orthotitanate Pigment. Filed June 17, 1976. PC $3.50/MF $3.00.

Patent application 698,646. Honeycomb-Laminate Composite Structure. Filed June 22, 1976. PC $4.00/MF $3.00.

Patent application 699,012. Field Effect Transistor and Method of Construction Thereof. Filed June 23, 1976. PC $3.50/MF $3.00.

Patent application 701,448. An Artificial Leg Employing a Mechanical Energy Storage Device for Hip Disarticulation. Filed June 30, 1976. PC $3.50/MF $3.00.

Patent 3,739,646. Failure Detection and Control Means for Improved Drift Performance of a Gimballed Platform System. Patented June 19, 1973. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent 3,970,373. Mirror Steering System. Filed Feb. 6, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,970,785. Tone Count Audiometric Computer. Filed May 13, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,970,919. Regulating Digital Power Supply. Filed June 19, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,970,943. Analog-to-Pulse Integrating Converter. Filed Mar. 27, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,970,961. Thermionic Cathode Transverse-Discharge Gas Laser Tube. Filed May 9, 1975. Patented July 20, 1976. Not available NTIS.

Patent 3,970,967. Controllable Ultrafast Light Shutter. Filed Oct. 22, 1974. Patented July 20, 1976. Not available NTIS.

Patent 3,970,973. Impedance Standard Apparatus. Filed Sept. 25, 1974. Patented July 20, 1976. Not available NTIS.

Patent 3,975,624. Two's Complement Subtracting System. Filed May 19, 1975. Patented Aug. 17, 1976. Not available NTIS.

Patent 3,975,625. Electronic Coordinate Transformation Using Multiplier Circuits. Filed Jan. 16, 1975. Patented Aug. 17, 1976. Not available NTIS.

Patent 3,975,676. Plural Electrode System for Determining the Electrical Parameters of Large Samples of Materials in Situ. Filed Mar. 29, 1974. Patented Aug. 17, 1976. Not available NTIS.

Patent 3,975,693. Dual Function Laser for Space Laser Communications. Filed Mar. 10, 1975. Patented Aug. 17, 1976. Not available NTIS.

Patent 3,975,699. Linear Roll-Off Filter Network. Filed June 19, 1975. Patented Aug. 17, 1976. Not available NTIS.

Patent 3,975,738. Periodic Antenna Surface of Tripole Slot Elements. Filed May 12, 1975. Patented Aug. 17, 1976. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agriculture Research Service, Hyattsville, Md. 20782

Patent application 681,962. Process for the Production and Germination of Entomophthora Resting Spores. Filed Apr. 30, 1976. PC $3.50/MF $3.00.

Patent application 721,644. Vaccine for Foot and Mouth Disease. Filed Sept. 8, 1976. PC $3.50/MF $3.00.

Patent 3,976,805. Preparation of High-Consistency Tomato Products. Filed Nov. 26, 1974. Patented Aug. 24, 1976. Not available NTIS.

Patent 3,979,286. Removal of Heavy Metal Ions From Aqueous Solutions With Insoluble Cross-Linked-Starch-Xanthates. Filed Oct. 16, 1974. Patented Sept. 7, 1976. Not available NTIS.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 555,330. Monitoring Circuit for Reactor Safety System. Filed Mar. 4, 1975. PC $3.50/MF $3.00.

Patent application 556,353. Removal of Zn or Cd and Cyanide From Cyanide Electroplating Wastes. Filed Mar. 7, 1975. PC $3.50/MF $3.00.

Patent application 557,566. Separation of Isotopes by Cyclical Processes. Filed Mar. 11, 1975. PC $3.50/MF $3.00.

Patent application 560,430. Gas Production Apparatus and Method. Filed Mar. 20, 1975. PC $3.50/MF $3.00.

Patent application 562,289. Three-Dimensional Display of Mathematical Figures. Filed Mar. 26, 1975. PC $3.50/MF $3.00.

Patent application 564,182. Liquefaction and Desulfurization of Coal Using Synthesis Gas. Filed Apr. 1, 1975. PC $3.50/MF $3.00.

Patent application 568,809. A Kit for the Rapid Preparation of 99mTc Red Blood Cells. Filed Apr. 16, 1975. PC $3.50/MF $3.00.

Patent application 570,924. Laser Isotope Separation by Multiple Photon Absorption. Filed Apr. 22, 1975. PC $3.50/MF $3.00.

Patent application 571,655. An Improved Heat Pipe Methanator. Filed Apr. 25, 1975. PC $3.50/MF $3.00.

Patent application 577,822. Tagging Explosives With Sulfur Hexafluoride. Filed May 15, 1975. PC $3.50/MF $3.00.

Patent application 580,499. Method of Isotope Separation by Chemi Ionization. Filed May 23, 1975. PC $3.50/MF $3.00.

Patent application 582,056. Method and Apparatus for Determination of Nuclear and Cytoplasmic Size in Biological Cells. Filed May 29, 1975. PC $3.50/MF $3.00.

Patent 3,911,272. Ion Illumination Angle Control for a Mass Spectrometer. Filed Apr. 29, 1974. Patented Oct. 7, 1975. Not available NTIS.

Patent 3,911,684. Method for Utilizing Decay Heat From Radioactive Nuclear Wastes. Filed Aug. 29, 1974. Patented Oct. 14, 1975. Not available NTIS.

Patent 3,916,338. Metal Atom Oxidation Laser. Filed May 13, 1974. Patented Oct. 28, 1975. Not available NTIS.

Patent 3,917,369. Adjustable Extender for Instrument Module. Filed Aug. 26, 1974. Patented Nov. 4, 1975. Not available NTIS.

Patent 3,928,821. High Energy Chemical Laser System. Filed Jan. 23, 1975. Patented Dec. 23, 1975. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20014

Patent application 699,202. Additive Composition for Making Dental Materials. Filed June 23, 1976. PC $3.50/MF $3.00.

Patent 3,718,740. Animal Semen Preparations of Increased Fertility. Filed Mar. 18, 1971. Patented Feb. 27, 1973. Not available NTIS.

Patent 3,973,970. Additive Composition for Making Dental Materials. Filed Jan. 7, 1975. Patented Aug. 10, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent application 635,552. Oceanographic Sensor With In-Situ Cleaning System. Filed Nov. 20, 1975. PC $3.50/MF $3.00.

Patent application 682,815. Self Developing Camera for Use in Macrophotography and Endoscopic Pathology. Filed May 3, 1976. PC $3.50/MF $3.00.

Patent application 701,486. Apparatus and Process for Preheating Main Boiler Superheater Headers. Filed June 30, 1976. PC $3.50/MF $3.00.

Patent application 704,155. Expanding Tool for Nondestructive Inspection of Flexible Wire Rope. Filed July 12, 1976. PC $3.50/MF $3.00.

Patent application 705,489. Transient Suppression Circuit for Push-Pull Switching Amplifiers. Filed July 15, 1976. PC $3.50/MF $3.00.

Patent 3,556,034. Prepackaged Buoyancy System. Filed Nov. 26, 1968. Patented Jan. 19, 1971. Not available NTIS.

Patent 3,621,447. Deep Submergence Electrical Assembly. Filed Dec. 22, 1969. Patented Nov. 16, 1971. Not available NTIS.

Patent 3,949,321. Conical Nozzle Aerodynamic Window. Filed Dec. 26, 1974. Patented Apr. 6, 1976. Not available NTIS.

Patent 3,965,474. Antenna for Receiving VLF/LF Transmission in Seawater. Filed Sept. 26, 1975. Patented June 22, 1976. Not available NTIS.

Patent 3,967,878. Optical Waveguide Coupler. Filed Mar. 3, 1975. Patented July 6, 1976. Not available NTIS.

Patent 3,969 691. Millimeter Waveguide to Microstrip Transition. Filed June 11, 1975. Patented July 13, 1976. Not available NTIS.

Patent 3,971,878. VLF Antenna Tower Base Insulator. Filed Oct. 3, 1975. Patented July 27, 1976. Not available NTIS.

Patent 3,971,931. LED Image Tube Light Valve. Filed Jan. 23, 1975. Patented July 27, 1976. Not available NTIS.

Patent 3,972,049. Asymmetrically Fed Electric Microstrip Dipole Antenna. Filed Apr. 24, 1975. Patented July 27, 1976. Not available NTIS.

Patent 3,972,050. End Fed Electric Microstrip Quadrupole Antenna. Filed Apr. 24, 1975. Patented July 27, 1976. Not available NTIS.

Patent 3,972,231. Method for Measuring Velocity and Direction of Currents in a Body of Water. Filed Nov. 19, 1975. Patented Aug. 3, 1976. Not available NTIS.

Patent 3,972,253. Multi-Size Socket Wrench. Filed Oct. 3, 1975. Patented Aug. 3, 1976. Not available NTIS.

Patent 3,972,615. Determination of Semi Opaque Plasma Temperatures. Filed Jan. 17, 1975. Patented Aug. 3, 1976. Not available NTIS.

Patent 3,973,510. Submersible Object Having Drag Reduction and Method. Filed Sept. 9, 1974. Patented Aug. 10, 1976. Not available NTIS.

Patent 3,974,458. Dual Field Excitation for a Carbon Dioxide Laser. Filed Oct. 21, 1975. Patented Aug. 10, 1976. Not available NTIS.

Patent 3,975 579. Conical Face-Seal for an Electrical Feedthrough. Filed Dec. 3, 1975. Patented Aug. 17, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE ARMY
Office of Judge Advocate General, Patent Division,
Room 2C–455, Pentagon, Washington, D.C. 20310

Patent application 637,793. Logarithmic Statistical Distribution Analyser. Filed Dec. 4, 1975. PC $3.50/MF $3.00.

Patent 3,931,568. Efficient Biasing Scheme for Microwave Diodes. Filed May 2, 1974. Patented Jan. 6, 1976. Not available NTIS.

Patent 3,932,020. Electrical Connectors. Filed Mar. 29, 1974. Patented Jan. 13, 1976. Not available NTIS.

Patent 3,961,898. Comparator Circuit for Automatic Analysis Apparatus. Filed Jan. 14, 1975. Patented June 8, 1976. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 622,995. Improved Method and Apparatus for Double-Beaming in Fourier Spectroscopy. Filed Mar. 1, 1976. PC $3.50/MF $3.00.

Patent application 687,284. Method and Apparatus for Tracing Electrical Cables. Filed May 17, 1976. PC $3.50/MF $3.00.

Patent application 691,162. Light Scattering Test Apparatus. Filed May 28, 1976. PC $3.50/MF $3.00.

Patent application 692,840. Non-Destructive Inspection of Composite and Adhesively Bonded Structures. Filed June 4, 1976. PC $3.50/MF $3.00.

Patent application 698,988. Recursive Processing of Multiple Intensity-Modulated Scans. Filed June 23, 1976. PC $3.50/MF $3.00.

Patent application 698,989. Tubular Plasma Display Seal Design. Filed June 23, 1976. PC $3.50/MF $3.00.

Patent 3,970,005. Mass Focus Explosive Layered Bomblet. Filed Jan. 25, 1969. Patented July 20, 1976. Not available NTIS.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 566,497. Folded Membrane Dialyzer With Mechanically Sealed Edges. Filed Apr. 9, 1975. PC $4.00/MF $3.00.

Patent application 567,340. Improved Method for Solidifying Liquid Radioactive Wastes. Filed Apr. 11, 1975. PC $3.50/MF $3.00.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th & C Sts., NW
Washington, D.C. 20240

Patent application 700,701. Method of and Apparatus for Manipulating Line Weight in an Image. Filed June 29, 1976. PC $4.00/MF $3.00.

Patent application 706,103. Extraction of Copper From Sulfide Ores. Filed July 16, 1976. PC $3.50/MF $3.00.

Patent 3,976,761. Preparation of TiO_2 and Artificial Rutile From Sodium Titanate. Filed Aug. 14, 1974. Patented Aug. 24, 1976. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters NASA—
Code GP–2, Washington, D.C. 20546

Patent application 678,520. Molded Composite Pyrogen Igniter for Rocket Motors. Filed Apr. 20, 1976. PC $4.00/MF $3.00.

Patent application 707,124. Gels as Battery Separators for Soluble Electrode Cells. Filed July 20, 1976. PC $3.50/MF $3.00.

Patent application 708,658. Process for Preparing Liquid Metal Electrical Contact Device. Filed July 26, 1976. PC $3.50/MF $3.00.

Patent application 708,660. Direct Heating Surface Combustor. Filed July 26, 1976. PC $3.50/MF $3.00.

Patent application 710,035. Mechanical Capacitor. Filed July 30, 1976. PC $4.00/MF $3.00.

Patent application 714,158. Germanium Coated Microbridge and Method. Filed Aug. 13, 1976. PC $3.50/MF $3.00.

Patent Re. 28,921. Visual Examination Apparatus. Patented Aug. 3, 1976. Not available NTIS.

Patent 3,971,230. Stirling Cycle Engine and Refrigeration Systems. Patented July 27, 1976. Not available NTIS.

Patent 3,971,535. Oblique-Wing Supersonic Aircrafts. Patented July 27, 1976. Not available NTIS.

Patent 3,971,915. Sun Angle Calculator. Patented July 27, 1976. Not available NTIS.

Patent 3,971,940. Detector Absorptivity Measuring Method and Apparatus. Patented July 27, 1976. Not available NTIS.

Patent 3,972,008. Method and Apparatus for Generating Coherent Radiation in the Ultraviolet Region and Above by Use of Distributed Feedback. Patented July 27, 1976. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 7, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-26-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-4-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-27-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-12-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-26-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-15-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	11-22-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	10-28-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-24-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-10-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-1-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-11-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-12-76

Expiration of patents: The patents within the range of numbers indicated below expire during May 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,934,766 to 2,939,144, inclusive
Plant Patents..... Numbers 1,938 to 1,948, inclusive

REISSUES

JUNE 21, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

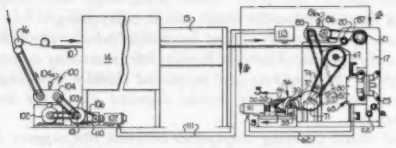
Re. 29,267
APPARATUS FOR STRAIGHTENING FABRIC

Frank Wilhite Leitner, and William Thomas Griffin, both of Charlotte, N.C., assignors to Coltron Industries, Inc., Mathews, N.C.

Original No. 3,839,767, dated Oct. 8, 1974, Ser. No. 243,385, Apr. 12, 1972. Application for reissue Feb. 20, 1976, Ser. No. 659,935

Int. Cl.² D06H *3/12*

U.S. Cl. 26—51.5 **12 Claims**



1. In a tenter having a pair of laterally spaced, elongate and longitudinally movable first and second fabric-engaging tenter chains for moving a fabric forwardly while applying lateral tension to the fabric therebetween; the combination therewith of

a. [tenter chains] *means* for driving said [fabric-engaging means] *tenter chains* to move at least the longitudinal center of the fabric therebetween at a predetermined substantially constant lineal speed and including a rotary input element adapted to be driven forwardly at a constant speed,

b. detecting means for detecting and producing a signal in response to a skew distortion in the forwardly moving fabric in which one side edge portion of the fabric is skewed forwardly of the opposite side edge portion thereof, and

c. responsive means interposed in said driving means and responsive to a skew correction signal of said detecting means for oppositely varying the lineal speed of said pair of fabric-engaging tenter chains in direct proportion to each other to correct the skew distortion without altering said constant lineal speed of the longitudinal center of the fabric, said responsive means comprising

1. first and second differential units including respective first and second rotary input portions driven by said input element, first and second rotary output portions on the respective first and second differential units drivingly connected to the respective first and second tenter chains, said first and second differential units also including first and second normally stationary rotary [housings] *members*, planetary gear means [in each housing] *carried by each rotary member*, and sun gears fixed on the input portion and the output portion, respectively, of each differential unit and meshing with the respective planetary gear means whereby each output portion is driven at a constant speed by said rotary input element while the respective [housings] *rotary members* are stationary, and

2. reversible means under control of said detecting means for rotating said first and second [housings] *rotary members* simultaneously in [opposite] directions [relative to each other whereby, when either housing rotates in a forward direction,] *required to increase and decrease by corresponding amounts* the [speed] *speeds* of the output [portion] *portions* of the respective differential [unit is reduced and the other housing is rotated in a reverse direction to increase the speed of the output portion of the other differential unit] *units*.

6. In a tenter having a pair of laterally spaced, elongate and longitudinallly movable first and second fabric-engaging means for moving a fabric forwardly while applying lateral tension to the fabric therebetween; the combination therewith of

a. means for driving said fabric-engaging means to move at least the longitudinal center of the fabric therebetween at a predetermined substantially constant lineal speed,

b. advancing means driven by said drive means for engaging the width of the fabric and advancing the same forwardly away from said fabric-engaging means,

c. detecting means for detecting and producing a signal in response to a skew distortion in the forwardly moving fabric in which one side edge portion of the fabric is skewed forwardly of the opposite side edge portion thereof and for detecting and producing a bow correction signal in response to a bowed distortion in the forwardly moving fabric,

d. first responsive means interposed in said driving means and responsive to a skew correction signal of said detecting means for oppositely varying the lineal speed of said pair of fabric-engaging means in direct proportion to each other to correct the skew distortion without altering said constant lineal speed of the longitudinal center of the fabric, and

e. second responsive means interposed in said driving means and responsive to a bow correction signal of said detecting means in which the central portion of the fabric is lagging or leading the opposite side edge portions thereof, for compensatively varying the speed of said advancing means to correct the bowed condition of the fabric.

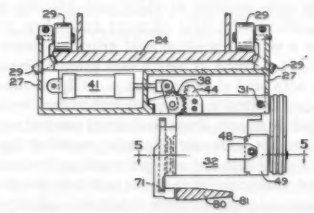
Re. 29,268
FABRIC CUTTING

Mathew Kuts, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Original No. 3,924,503, dated Dec. 9, 1975, Ser. No. 576,325, May 12, 1975. Application for reissue Aug. 26, 1976, Ser. No. 717,932

Int. Cl.² B23D *19/02*; B26D *1/20*

U.S. Cl. 83—488 **9 Claims**



1. A bias cutting apparatus for cutting rubberized fabric comprising a support frame, a carriage mounted on said support frame for reciprocal movement, drive means connected to said carriage for reciprocating said carriage, a cutter support member pivotally secured to said carriage, a cutter means journaled on said cutter support member for rotation thereon, power means mounted on said carriage operatively connected to said cutter means for rotating said cutter means, said cutter means having a plurality of spaced linear cutting edges, a guide bar secured to the lower portion of said support frame over which fabric is moved and under which a conveyor belt travels, anvil means mounted on said cutter support member

for movement therewith, said anvil means having a linear cutting edge, said cutter means having its cutting edges parallel to said linear cutting edge of said anvil means, and power operated means interconnecting said carriage and said cutter support member for pivoting said cutter support member on said carriage to move said cutter support member and anvil away from said guide bar to facilitate the movement of fabric while said cutter support member and carriage are moved back for a subsequent cutting of the fabric.

Re. 29,269

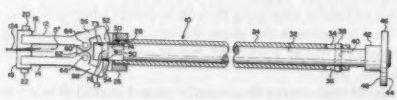
AUTOMATIC LEAD STRAIGHTENING OF AXIAL LEADED COMPONENTS

Denver Braden, San Diego, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

Original No. 3,948,298, dated Apr. 6, 1976, Ser. No. 562,320, Mar. 26, 1975. Application for reissue Sept. 24, 1976, Ser. No. 726,316

Int. Cl.² B21F *1/02*

U.S. Cl. 140—147 **3 Claims**



1. A straightening mechanism for an elongated cylindrical element having an elongated axis comprising a pair of gripping means for engaging diametrically opposite sides of the periphery of said element and a cam follower coupled to [a second end of] each of said gripping means, an elongated hollow tube, a support member secured to a first end of said tube with each of said gripping means being pivotally mounted on said support member [intermediate said pad and said cam follower], an elongated rod slideably positioned inside of said tube so as to be capable of reciprocation back and forth along said elongated axis, coupling means constructed to limit the amount of said reciprocation of said rod and to couple together said rod and said tube so that they will rotate in unison, a cam secured to a first end of said rod which engages said cam [followers] *follower* and which is shaped so that when said rod is positioned in a first position said gripping means are pivoted to an open position at which said gripping means are not in engagement with said element and when said rod is positioned in a second position said gripping means are pivoted to a closed position at which said gripping means are in engagement with said element, an operating member having first and second control surfaces secured to the second end of said rod which is remote from said cam, control means constructed to interact with said operating member for controlling the position of said rod and drive means for rotating said tube, said rod, said support member and said gripping means as a unit about said element while simultaneously drawing said unit along said cylindrical element while said gripping means engage said cylindrical element, wherein said drive means comprises a carriage that carries said [rod] *tube* and a carriage reciprocation means for driving said carriage back and forth along said elongated axis in a reciprocating manner and said control means comprises a [stationary] frame member, an opening member secured to said frame member that engages said first control surface of said operating member to force said rod to said first position at a first time and a closing member secured to said frame member that engages said second control surface of said operating member to force said rod to said second position at a second time as said carriage and said rod reciprocate back and forth.

Re. 29,270

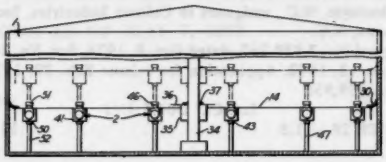
FLOATING COVER FOR A TANK

Ardell H. Nelson, 4055 Hollister Road, Houston, Tex. 77055

Original No. 3,861,555, dated Jan. 21, 1975, Ser. No. 317,371, Dec. 22, 1972. Application for reissue Sept. 9, 1975, Ser. No. 611,614

Int. Cl.² B65D *87/18*

U.S. Cl. 220—220 **18 Claims**



11. A floating cover for inside a tank comprising:

a plurality of laterally spaced horizontal tubular pontoons,

a plurality of spaced parallel support bars extending across the tops of the pontoons and supported thereby, said support bars having clamping means disposed along the length thereof,

metal sheets covering the spaces between the support bars, said sheets being spaced above the pontoons and extending across them, the edge portions of said sheets being engaged by said clamping means and deformed thereby to form metal-to-metal seals defining a gas tight deck above the pontoons, and

sealing means extending around said deck for sliding engagement with the side wall of a tank.

Re. 29,271

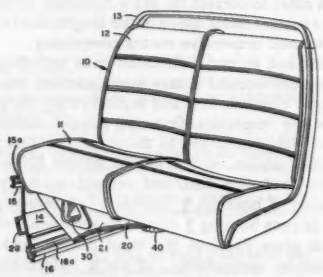
CANTILEVERED SEAT FOR MOTORCOACH VEHICLES OR THE LIKE

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Original No. 3,897,974, dated Aug. 5, 1975, Ser. No. 380,753, July 19, 1973. Continuation-in-part of Ser. No. 211,423, Dec. 23, 1971, Pat. No. 3,747,979. Application for reissue Jan. 30, 1976, Ser. No. 653,742

Int. Cl.³ A47C *7/02*; B60N *1/02*

U.S. Cl. 297—451 **34 Claims**



1. In a multi-passenger seat for a vehicle, the combination comprising: a horizontal seat frame having two elongated horizontal stretcher members and cross frame means interconnecting said stretcher members at laterally spaced locations to form a rigid structure; an inclined arcuate truss frame located beneath said horizontal stretcher members and including [forward and rear] *an* inclined arcuate truss frame [members] *means* rigidly attached at [their] *its* upper [ends] *end* adjacent said stretcher members [respectively] and inclined downwardly from said [attachments] *attachment*; the curvature of said truss frame [members]

means being upwardly toward said horizontal seat frame thereby providing by said arcuate shape less underseat obstruction from the inclined truss [member] *means* and a resultant greater leg and foot room; and means for mounting the wall ends of said stretcher members and the lower [ends] *end* of said inclined arcuate truss frame [members] *means* to the wall of said vehicle at a location above the floor, said seat being characterized in there being no connection between said seat and the floor of the vehicle.

Re. 29,272

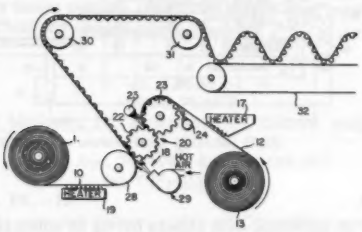
WATER RESISTANT CORRUGATED PAPERBOARD

Harold L. Hintz, and Joseph T. Webb, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Original No. 3,849,224, dated Nov. 19, 1974, Ser. No. 273,835, July 21, 1972. Application for reissue June 7, 1976, Ser. No. 694,046

Int. Cl.² B31F *1/22*

U.S. Cl. 156—208 **10 Claims**



1. In the process of manufacturing water resistant corrugated paperboard, consisting of at least one linerboard component having both sides thereof coated with a film of thermoplastic material, and at least one corrugating medium component having both sides thereof coated with a film of thermoplastic material, the steps of:

a. pretreating the said corrugating medium component, *before both sides thereof are coated with the film of thermoplastic material*, with an internal size treatment selected from the group consisting of 0.75–1.0% rosin with about 1.5% alum, 0.2% stearic anhydride with 0.3–0.4% alum, or 0.2% succinic anhydride with 0.3–0.4% alum to inhibit the water wicking tendencies thereof;

b. applying a direct pre-heat treatment to one side of the said coated and sized corrugating medium prior to entering the corrugating nip of a corrugating machine;

c. applying an indirect pre-heat treatment to the opposite side of the said coated and sized corrugating medium by heating at least one of the corrugating rolls of the corrugating machine;

d. applying a lubricating treatment in the form of a water spray or a water spray containing detergent to the corrugating nip of the corrugating machine;

e. applying a direct pre-heat treatment to one side of the said coated linerboard component prior to entering the bonding nip of a corrugating machine;

f. applying an indirect pre-heat treatment to the opposite side of the said coated linerboard component by heating the pressure roll of the corrugating machine;

g. applying an additional direct heating treatment at the bonding nip of the corrugating machine to render the thermoplastic film surface on one of the components tacky and bondable;

h. pressing the tacky and bondable surface of one of the components into contact with the other of said components at the bonding nip; and,

i. cooling the laminate thus formed to allow the bond to set.

Re. 29,273

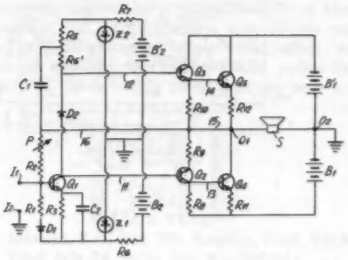
DIRECT-CURRENT-COUPLED TRANSISTOR POWER AMPLIFIERS

Martin G. Reiffin, 9 Charles Place, Mahopac, N.Y. 10541

Original No. 3,376,388, dated Apr. 2, 1968, Ser. No. 654,947, May 10, 1967. Continuation-in-part of Ser. No. 311,732, Sept. 26, 1963, Pat. No. 3,372,342, and Ser. No. 473,981, July 22, 1965, abandoned, and Ser. No. 501,515, Oct. 22, 1965, abandoned, and Ser. No. 563,586, July 7, 1966, and Ser. No. 388,399, Aug. 10, 1964, abandoned, which is a continuation-in-part of Ser. No. 270,011, April 2, 1963, Pat. No. 3,281,535. Application for reissue Mar. 27, 1975, Ser. No. 562,956

Int. Cl.² H03F *1/34*

U.S. Cl. 179—1 A **58 Claims**



7. [In combination, an amplifier as recited in claim 1,] *A transistor power amplifier comprising a single-ended push-pull output stage including at least two transistors connected in series at a midpoint of the stage, a split power supply connected to said output stage and having a center-tap, a pair of output terminals, means D.C.-coupling one of said output terminals to said center-tap, means D.C.-coupling the other output terminal to said output stage midpoint, a complementary-symmetry push-pull drive stage, means D.C.-coupling said drive stage to said output stage, amplification means, means D.C.-coupling said amplification means to said drive stage, and a D.C. feedback network for maintaining said output terminals at substantially the same D.C. potential,* preamplifier means connected in cascade with said amplifier, an inner negative feedback loop including said amplifier for raising the high-frequency cutoff of said amplifier to a predetermined frequency, said preamplifier means comprising a transistor stage preceding said inner feedback loop, said transistor stage having a high-frequency cutoff substantially lower than said predetermined frequency, and an outer negative feedback loop including said amplifier and said preamplifier transistor stage.

Re. 29,274

MECHANICAL COUNTER

Richard L. Collette, Hoffman Estates; Frank S. Vojir, Berwyn, and Roger E. Watts, Chicago, all of Ill., assignors to Guardian Electric Manufacturing Company, Chicago, Ill.

Original No. 3,863,052, dated Jan. 28, 1975, Ser. No. 452,183, Mar. 18, 1974. Application for reissue Dec. 11, 1975, Ser. No. 639,879

Int. Cl.² G06M *3/02*

U.S. Cl. 235—91 R **42 Claims**

1. A mechanical counter device comprising, in combination:

an indexing member positionable to a desired set detent position by movement in a first sense;

detent means movable in unison with said indexing member;

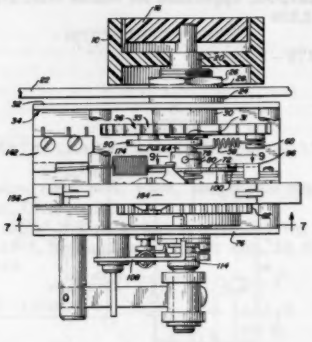
detent engaging means fixed relative to said detent means and cooperative therewith to enable positioning said indexing means to the desired set detent position;

a register member normally in a null position and positionable from said null position in a second sense to an active

position, said second sense being distinct from said first sense, said register member also positionable in said first sense by a counting mechanism;

register member locking means fixed in position relative to movement of said register member in the second sense and positionable in unison with said detent means;

receiving means for said locking means, said receiving means attached to move in unison in the second sense with said register member, said receiving means engageable with said locking means when said register is moved to the active position.



unlocking means attached to the register member and engageable with said locking means when said register member is in the null position to thereby release said locking means from said lock receiving means;

means for driving the register member including said counting mechanism in the first sense from a non-registered position to the registered position; and

means for biasing the register member toward the null position.

Re. 29,275

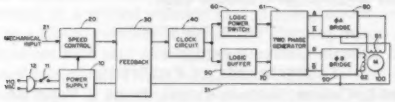
MOTOR CONTROL SYSTEM

Herbert Berman, 1018 Beacon St., and Stanley N. Tenen, c/o Dr. Herbert Berman, 1018 Beacon St., both of Brookline, Mass. 02146

Original No. 3,849,709, dated Nov. 19, 1974, Ser. No. 354,355, Apr. 25, 1973. Application for reissue June 9, 1975, Ser. No. 585,082

Int. Cl.² H02P *5/40*

U.S. Cl. 318—227 **10 Claims**



1. In a system for controlling a motor having at least one field winding and a variable frequency oscillator whose output controls motor speed, the improvement comprising speed control means coupled to said oscillator for controlling its output frequency, and including a light source a photo resistor and modulating means disposed intermediate said light source and resistor, said photo resistor characterized by a relatively long off or decay time constant as said photo resistor traverses from its low resistance to high resistance state.

Re. 29,276

LENS ATTACHMENT FOR FLASH-LIGHT PHOTOGRAPHING

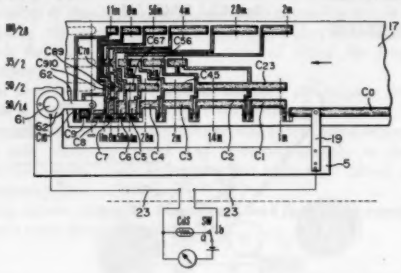
Taizo Mitani, and Takayuki Shirashaki, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 3,738,240, dated June 12, 1973, Ser. No. 184,351, Sept. 28, 1971. Application for reissue June 9, 1975, Ser. No. 584,840

Claims priority, application Japan, Oct. 2, 1970, 45-86939

Int. Cl.² G03B *7/16, 7/20;* **G03D** *13/00*

U.S. Cl. 354—32 **25 Claims**



1. For an automatic flash camera having an automatic diaphragm control and a photograhic lens with a rotatable focusing ring, a lens attachment, comprising mounting means for detachably mounting the attachment at the end of the lens, interconnecting means rotatably mounted on said mounting means and engageable with the focusing ring, variable resistance means mounted on said mounting means and said interconnecting means, said resistance means being variable by movement of said interconnecting means with the focusing ring and having an adjustable member which is movable between a plurality of positions, said variable resistance means exhibiting one range of resistances corresponding to one type of lens when the member is in one position and the interconnecting means is moved relative to the mounting means through a given path, said variable resistance means exhibiting another range of resistances corresponding to another type of lens when the member is in another position and the interconnecting means is moved relative to the mounting means through a path corresponding to the one path, electrical means connected with said variable resistance means and coupled to said diaphragm control means for adjusting the diaphragm on the basis of an electrical resistance value based upon the rotation of the focusing ring and the position of said member, said member being adjustable to a position causing said resistance means to exhibit a range of values corresponding to the type of lens.

PLANT PATENTS

GRANTED JUNE 21, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,062

KALANCHOE PLANT

Roy Nyal Pittman, 4211 Washington, Amarillo, Tex. 79110

Filed June 18, 1975, Ser. No. 588,004

Int. Cl.[2] A01H *5/02*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Kalanchoe plant substantially as herein disclosed characterized by the unique combination of flowers borne clearly above the foliage, said flowers being of large and uniform size, graceful, cusped petal shape and distinctive, attractive and uniform bright contrasting crimson flower coloring contrasting with a large green glossy regular leaf and upright sturdy branches.

4,063

ROSE PLANT

Samuel McGredy, IV, Auckland, New Zealand, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Apr. 26, 1976, Ser. No. 680,507

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—15 **1 Claim**

1. The new and distinct variety of Grandiflora rose plant substantially as herein illustrated and described, which is characterized by a plurality of the following features, in combination, namely a notably vigorous, upright habit of growth, many-branched and tall, with abundant glossy medium-sized foliage, said plant being more hardy and more resistant to mildew than is usual with plants of the same species grown under comparable conditions; a nearly continuous blooming habit throughout the season; blooms with double petalage which have a predominantly yellow color effect, varying mainly in depth of shade, and having a mild, pollen-like fragrance; many of the flowering stems carrying only a single flower.

4,064

PEACH TREE

William Y. Minami, P.O. Box 788, Reedley, Calif. 93654

Filed July 26, 1976, Ser. No. 708,911

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is characterized by its regular and prolific bearing of early ripening small to medium, semi-freestone, yellow-fleshed fruit; and by its general resemblance to the Springcrest (unpatented) peach tree, but from which it is distinguished by its fruit ripening from 7 to 10 days earlier.

PATENTS

GRANTED JUNE 21, 1977

ERRATA

For CLASS	See PATENT NO.
280–408	4,030,171
308–006 C	4,030,191
057–009	4,030,248
403–405	4,030,266
428–586	4,030,525
273–110	4,030,555
277–092	4,030,730
293–071 R	4,030,735
273–095 E	4,030,760
273–106.5 A	4,030,761
273–134 AD	4,030,762
273–134 D	4,030,763
273–148 A	4,030,764
273–148 R	4,030,765
273–163 R	4,030,766
280–047.17	4,030,768
280–042	4,030,769
280–043.23	4,030,770
280–088	4,030,771
280–106 R	4,030,772
280–153 R	4,030,773
280–261	4,030,774
280–477	4,030,775
280–477	4,030,776
280–714	4,030,777
285–174	4,030,778
296–015	4,030,779
296–100	4,030,780
297–397	4,030,781
408–197	4,030,843
075–234	4,030,891
428–226	4,030,892
210–474	4,031,032
261–106	4,031,180
426–285	4,031,238
358–212	4,031,315
235–012	4,031,357
361–007	4,031,432
361–338	4,031,433
361–172	4,031,434
361–186	4,031,436
330–030 D	4,031,495
364–200	4,031,514
364–200	4,031,515
364–200	4,031,516
364–200	4,031,517
364–200	4,031,518

ERRATA – Continued

364–900	4,031,519
364–200	4,031,520
364–200	4,031,521
346–001	4,031,561
346–035	4,031,562
346–075	4,031,563

PATENTS

GRANTED JUNE 21, 1977

GENERAL AND MECHANICAL

4,030,139
PROTECTIVE APRON AND METHOD OF FABRICATION
Marvin A. Sonntag, Rte. 1, Green Lake, Wis. 54941
Filed Feb. 25, 1976, Ser. No. 661,215
Int. Cl.² A41B *13/10*
U.S. Cl. 2—51 **1 Claim**

1. A protective apron comprising a fabric base sheet having an over-all plastic coating, said sheet including a main panel covering portions of the wearer, a bib panel thereabove and a re-enforcing panel overlying the top portion of said main panel in the area of the wearer's belly, said re-enforcing panel comprising a belly band completely across the apron from one side to the other and comprising a top layer of substantially all plastic superimposed on the plastic coating of the base sheet fabric and laminated thereto throughout the contiguous areas thereof.

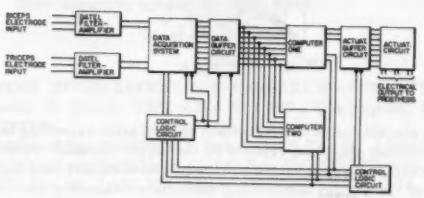
4,030,140
HARD SAFETY HAT
Terry L. Burt, 5169 Highland Drive, Marrero, La. 70072
Filed Aug. 9, 1976, Ser. No. 712,434
Int. Cl.² A42B *3/02*
U.S. Cl. 2—410 **2 Claims**

1. A hard safety hat, having a crown, for workers wearing safety goggles, comprising:

a. a brim defined by a lower portion of said crown;

b. a bill mounted forwardly on said crown and above said brim defining a spacing therebetween sufficient to accommodate the height of said goggles and constitute a support thereof when not in use.

4,030,141
MULTI-FUNCTION CONTROL SYSTEM FOR AN ARTIFICIAL UPPER-EXTREMITY PROSTHESIS FOR ABOVE-ELBOW AMPUTEES
Daniel Graupe, Fort Collins, Colo., assignor to The United States of America as represented by the Veterans Administration, Washington, D.C.
Filed Feb. 9, 1976, Ser. No. 656,412
Int. Cl.² A61F *1/00, 1/06*
U.S. Cl. 3—1.1 **31 Claims**

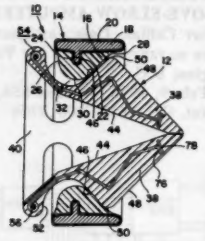


1. For use in combination with an electrically-operated prosthetic appliance for replacing a missing limb, a control circuit responsive to input signals supplied thereto for operating said appliance and a set of at least two electrodes adapted to receive electromyographic (EMG) signals from the stump of the missing limb when fastened thereto, the subcombination for processing said EMG signal preparatory to delivering same to said control circuit which comprises: data processing means for analyzing the EMG signal so as to reduce it to a near minimum number of linear time series model parameters which are effective to differentiate each of several functions of the missing limb from all other functions thereof, data acquisition means for collecting and storing historical data produced by the amputee at the electrodes relative to the maximum and minimum values of said linear time series model parameters for each limb function to be performed by the prosthesis, comparison measuring means for repeatedly sampling current data on said linear times series model parameters produced by the amputee at the electrodes and comparing said current data with a set of predetermined values therefor chosen on the basis of said historical data, and means responsive to the comparison measuring means operative during each sampling interval to deliver one or more output signals to the control circuit effective to initiate or continue actuation of only that function or those functions of the prosthesis wherein the sampled data falls within the set of unique values chosen for a particular function.

4,030,142
OCCLUDER FOR PROSTHETIC HEART VALVE ASSEMBLY
Gerald W. Wolfe, Paradise, Calif., assignor to InterMed, Inc., Wayne, Pa.
Filed Mar. 26, 1976, Ser. No. 670,690
Int. Cl.² A61F *1/22*
U.S. Cl. 3—1.5 **9 Claims**

7. An elongate occluder of a prosthetic heart valve assembly, said occluder being adapted to be positioned through a seating-ring passage for movement in its direction of elongation between closed and opened positions, said occluder including an upstream annular section and a downstream sealing section, both of which have a larger maximum diameter than the minimum diameter of the seating-ring passage, said downstream sealing section being provided by a plurality of cuspids which engage each other to define a closed sealing section when the occluder is in a closed position, each of said cuspids being joined to the upstream annular section through a flexi-

ble hinge section for permitting outward flexure of said cuspids when the occluder is in an opened position to define a central open passage through the occluder for the flow of blood; the improvement wherein the upper annular section and hinge section of the occluder are part of a unitary armature construction, said armature construction further including a plurality of circumferentially spaced arms extending in a downstream direction relative to the upper annular section, said cuspids being separate unitary plastic members, and each arm of the unitary armature construction extending into the interior of a respective cuspid for retaining said cuspids in their proper operative position and for reinforcing said cuspids.



4,030,143

ENDOPROSTHETIC BONE JOINT DEVICES

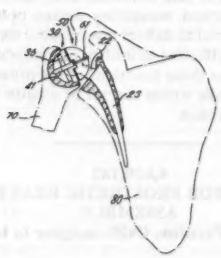
Martin Arthur Elloy, Liverpool, and Frank Howard Beddow, West Kirby, both of England, assignors to National Research Development Corporation, London, England

Filed Jan. 29, 1976, Ser. No. 653,524

Claims priority, application United Kingdom, Jan. 31, 1975, 04421/75

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.91 **8 Claims**



8. An endoprosthetic bone joint device comprising:

a first component in the form of a ball connected through a neck to the wider end of a tapered stem;

a first cup engaged with said ball by a mutual snap fit to form a ball and socket joint;

and a second cup held in releasable engagement with said ball, said second cup being slotted from its rim to accommodate said neck and predetermine the relative positions of said second cup and said ball, and the rim of said first and second cups being complementary and abutted to predetermine the positions of said cups relative to each other.

4,030,144

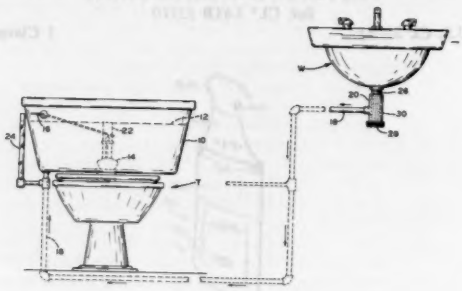
APPARATUS AND ARRANGEMENT FOR CONSERVING WATER FOR TOILET FLUSHING

Augusto Cuevas Aleman, Maria de la Luz Bringas No. 44, Colonia del Valle, Mexico 12, D.F., Mexico

Filed Sept. 2, 1975, Ser. No. 609,668

Int. Cl.² A47K *4/00*

U.S. Cl. 4—3 **2 Claims**



1. In a combination; a tank for a flush toilet adapted to be filled to a predetermined level; a wash basin adapted to receive water; a drain being positioned in said basin at the lowermost level of said basin for water flow from said basin; a continuous fluid conduit connecting said drain in uninterrupted fluid flow in relation to said tank; overflow means in said tank for preventing filling of said tank above said predetermined level;

a fluid inlet at the lowermost portion of said tank; said conduit being coupled to said inlet;

a transparent tube being in fluid communication with said conduit adjacent said fluid inlet; said tube having a portion extending vertically upwardly from said inlet exteriorly of said tank to a vertical level higher than said predetermined level, with the fluid level in said tube indicating the fluid level in said tank.

4,030,145

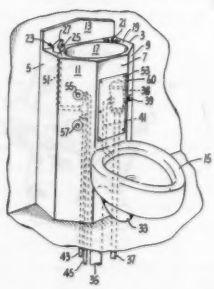
COMBINATION PLUMBING FIXTURE HAVING SINGLE FLOOR WASTE OUTLET

Frank E. Rowan, Burlingame, Calif., assignor to Aluminum Plumbing Fixture Corporation, Burlingame, Calif.

Filed Feb. 12, 1976, Ser. No. 657,474

Int. Cl.² E03D *1/00, 3/00, 5/00*

U.S. Cl. 4—10 **3 Claims**



1. A combination plumbing fixture comprising:

a generally horizontal, completely enclosed column-like body having a base, a top, and an access opening defined therein between said base and said top, said body being mounted on a floor;

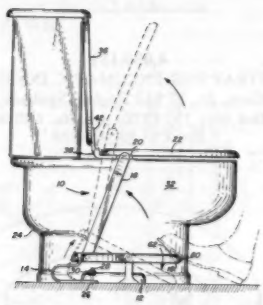
a wash basin positioned on said body top;
a toilet bowl mounted on said body to be located between said access opening and said base and extending outwardly therefrom;
a combination drinking fountain and faucet mounted on said body top to introduce water into said wash basin;
a cover plate covering said access opening;
a flush valve for controlling flushing of said toilet bowl, said flush valve being positioned within said body;
shutoff valves for controlling flow of hot and cold water into said combination drinking fountain and faucet, said shutoff valves being located within said body;
a basin drain pipe located within said body and connecting said wash basin to said toilet bowl so that water from said basin drains into said toilet bowl; and
main conduits for conducting water to said combination and to said toilet bowl via said shutoff and flush valves respectively, and a connecting conduit connecting said flush valve with said toilet bowl, said conduits all being located within said body, said main conduits extending in an essentially vertical direction through the floor into said body through said body base, said fixture being completely self-contained and mounted on the floor with all plumbing connections being made through the floor;
said shutoff and flush valves being located adjacent said access opening so that said valves are accessible through said access opening.

4,030,146

TOILET SEAT LIFTING APPARATUS INCLUDING A RESILIENT BOWED MEMBER FOR PREVENTING THE SEAT FROM SLAMMING

Ted S. Pilkington, 1050 Crestview Drive F-41, Mountain View, Calif. 94040, and Henry H. Castle, 11123 Beacon Ave., South, Seattle, Wash. 98178

Filed Dec. 29, 1975, Ser. No. 645,248
Int. Cl.² A47K *3/10*
U.S. Cl. 4—251 **3 Claims**



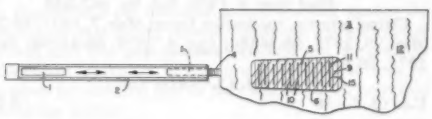
1. A toilet seat lifting apparatus for attachment to a toilet having a bowl with a lower flange and a seat, said apparatus comprising:
a base having means adapted to be secured to a lower flange of a toilet bowl and including an upright portion and a flexible elongated portion, said upright portion having a top surface with an arcuate shape, and said flexible elongated portion extending rearwardly of said base and terminating in a distal end that is formed into a latch;
a foot pedal having first and second ends and including a central portion, a foot-receiving portion proximate said first end which is adapted to be depressed by the foot of a user, and a connecting portion proximate said second end having means forming a recess for receiving and retaining said latch, said central portion having a groove therein which is bounded by an upper surface having an arcuate shape that generally conforms to said top surface, said groove serving to receive the means forming said top surface such that said central portion is pivotally mounted to said upright portion, said latch engaging said means forming a recess so as to form said flexible elongated portion into a bowed C-shape with said latch extending generally upwardly, said flexible elongated portion serving to urge said second end in an upward direction and to pivot said foot pedal about said upright portion;
an arm having a third end attached to said connecting portion and having a fourth end; and
means connected to said fourth end and adapted for securing said arm to a toilet seat, whereby when said foot-receiving portion is depressed said toilet seat is caused to raise, and when said foot-receiving portion is released said flexible elongated portion damps the force associated with the lowering of said seat so as to prevent said seat from slamming against the toilet bowl.

4,030,147

POOL DIVER SAFETY AND RESEARCH APPARATUS

Harold A. Jewett, 5451 42nd St., NW., Washington, D.C. 20015

Division of Ser. No. 620,143, Oct. 6, 1975, Pat. No. 3,997,924, which is a continuation-in-part of Ser. No. 596,173, July 15, 1975, Pat. No. 3,956,779. This application July 14, 1976, Ser. No. 705,298
Int. Cl.² E04H *3/16, 3/18;* F16L *22/02*
U.S. Cl. 4—172 **10 Claims**



1. In combination
a swimming pool having a deck
a railway having a runway flanked by side walls rising higher than said runway
a car provided with rollers disposed for traveling along said runway between said walls
said railway extending from a starting point distance from said pool toward a point adjacent an edge of said pool
an abutment located at said last-mentioned point and disposed for blocking movement of said car when impacted by it during use
said car having an upward-facing top portion disposed for supporting a diver reclining thereon in belly-down prone position
whereby impacting of said abutment by said car abruptly terminates movement of the latter, thereby permitting momentum acquired by said diver during said travel to propel him outwardly of said edge and over water in the pool.

4,030,148

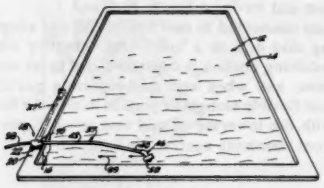
SWIMMING POOL SURFACE CLEANING DEVICE

Jeffrey Rosenberg, 1270 Stillwater Drive, Miami Beach, Fla. 33141

Filed May 17, 1976, Ser. No. 686,932
Int. Cl.² E04H *3/16, 3/18;* F16L *22/02*
U.S. Cl. 4—172 **9 Claims**

1. For mounting to the edge of a pool above the normal water level of the pool, a device for urging floating debris on the water surface toward a skimmer having an opening at the normal waterline,
said device comprising,
an elongate tubular arm having:
a proximal end zone including means to connect to a waterflow supply through the arm to the distal end zone,

means to mount the proximal end zone to the pool edge, said tubular arm including an intermediate zone extending outwardly and downwardly from said proximal end zone, and having a distal end zone below the proximal end zone and above the normal waterline of the pool, and said distal end zone having an opening facing toward said proximal end zone,



said means to mount including a base and fastener means to connect the base to the pool edge, and

vertical pivot means connecting the proximal end zone of the tubular arm to said base to permit a swinging movement of the arm about the axis of said pivot means.

4,030,149

BED FOR THE INVALID

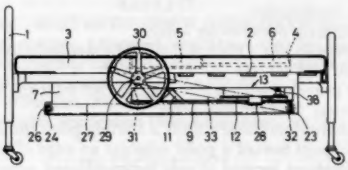
Mikio Kato, Tokyo, Japan, assignor to Nippon Felt Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,830

Claims priority, application Japan, Mar. 7, 1975, 50-28159; Mar. 29, 1975, 50-36584; Apr. 4, 1975, 50-41494; June 18, 1975, 50-83067[U]

Int. Cl.² A61G *7/02*

U.S. Cl. 5—90 **8 Claims**



1. An invalid bed comprising a bed frame, a mat having formed centrally thereof a defecating hole, an auxiliary frame provided beneath said defecating hole, an excreta receptacle having a seat, a tank and a front covering mounted in said auxiliary frame, a truck on which said excreta receptacle is carried, a first and a second auxiliary mat arranged to normally close said defecating hole, a support plate for said first and second auxiliary mats, and means for supporting said first auxiliary mat support plate so as to be movable vertically, wherein said means for supporting said first auxiliary mat support plate is reciprocatable horizontally in said auxiliary frame and said excreta receptacle is also provided in said auxiliary frame and coupled integral to said means by connecting bars so that said truck is movable while tugging said means disposed adjacent thereto.

4,030,150

COMBINATION HAND TOOL

Lloyd R. Fisher, Longmont, Colo., assignor to Joe W. Page, Jr., Huntington Beach, Calif.

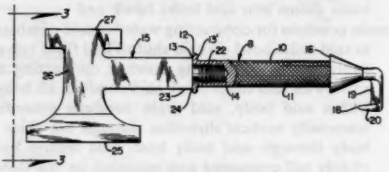
Filed Dec. 24, 1975, Ser. No. 644,096

Int. Cl.² B25B *1/00*

U.S. Cl. 7—15 **4 Claims**

1. In a combination hand tool adapted for interchangeable, releasable attachment of implements thereto in which each implement is provided at one end with a male connecting portion and an enlarged shoulder having a correspondingly enlarged, squared end surface facing toward the male connecting portion, the combination therewith comprising:

a handle including hand gripping means and a first shoulder portion at the forward end of said handle enlarged with respect to said hand gripping means, said first enlarged shoulder portion having a correspondingly enlarged, squared end surface facing in a forward direction away from said hand gripping means and socket means in the forward extremity of said handle adapted for insertion and detachable connection of the male connecting portion on the implement, the enlarged, square end surface of the shoulder portion on each implement adapted to



frictionally engage said enlarged, squared end surface on said first shoulder portion when the male connecting portion is fully inserted into said socket means; and

a second shoulder portion on said handle at the rearward end of said handle enlarged with respect to said hand gripping means, said shoulder portion at the rearward end of said hand gripping means converging rearwardly away from said hand gripping means into a reverse curved, forwardly directed knife, the cutting edge of said knife being spaced from and in facing relation to said handle, and said knife terminating in an elongated, forwardly projecting end portion with a beveled, slightly pointed tip in parallel, laterally spaced relation to said hand gripping means.

4,030,151

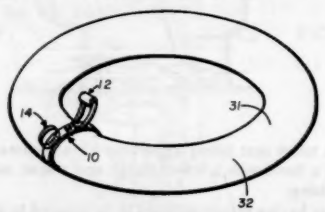
TOW STRAP FOR PNEUMATIC INNER TUBE

Edwin E. McKeen, Jr., E. 112 Regina, Spokane, Wash. 99218

Filed May 19, 1976, Ser. No. 688,062

Int. Cl.² B63C *9/08*

U.S. Cl. 9—1.7 **3 Claims**



2. A towage strap for a pneumatically inflated inner tube, comprising, in combination:

an elongate, flexibly resilient strap-like body, having means at the end parts thereof to releasably fasten each end to the other and having a length when fastened slightly less than the periphery of an annular section of the inner tube to be serviced;

a loop-like tow line fastening structure carried by the body inwardly adjacent one end and on the side of the body opposite to that adjacent a serviced inner tube;

a rudder carried by the body on the same surface as the tow line fastening structure and approximately one-fourth of a body length away therefrom; and

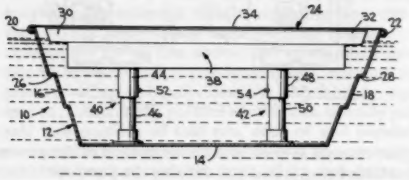
a handle carried by the body, near the tow line fastening structure, to extend away from the body.

4,030,152

AUTOMATICALLY ADJUSTING BOAT SEAT

Anthony J. Souza, Lancaster, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed July 12, 1976, Ser. No. 704,749
Int. Cl.² A47C 3/34; B63B 29/04
U.S. Cl. 9—7 11 Claims



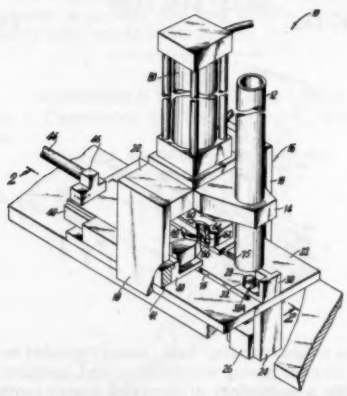
1. A boat construction comprising hull means and seat means therefor, guide means operatively engaged between said hull means and said seat means to guide said seat means for movement along a vertical path between a lowered position and a raised position, support means for supporting said seat means in said lowered position during normal use of the boat, flotation means carried by said seat means for automatically raising said seat means in the event of swamping of the boat, and stop means limiting the upward movement of said seat means to said raised position.

4,030,153

ATTACHMENT FOR THREAD CUTTING APPARATUS

Sami Shemtov, Brooklyn, N.Y., assignor to I-T-E Imperial Corporation EFCOR Division, East Farmingdale, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,829
Int. Cl.² B23G 1/02
U.S. Cl. 10—89 WH 9 Claims



1. An attachment for an apparatus for forming threads on a tubular workpiece, said attachment comprising:

a stationary base plate;

delivery means for supplying a stream of workpieces to a receiving station on said base plate;

reciprocating means movable along said base plate for gripping and removing one workpiece at a time from said receiving station;

transfer means for moving the workpiece from said reciprocating means through a first opening in said base plate of thread cutting means and for subsequently removing the workpiece from the thread cutting means after the threads are cut;

discharge means for releasably receiving a threaded workpiece from said transfer means, said discharge means being movable in synchronism with said reciprocating means and in timed relationship with said transfer means to engage the threaded workpiece at approximately the same time that said reciprocating means grips an unthreaded workpiece, said discharge means being arranged to release the threaded workpiece at approximately the same time that said transfer means initiate the movement of the unthreaded workpiece towards the thread cutting means;

said delivery means including a vertically oriented tubular chute in which the workpieces are positioned one above the other, a retractable positioning pin positioned coaxially below said chute whereby the force of gravity drops the lowermost workpieces onto said pin, spring means for biasing said pin through a second opening in said base plate to receive the lowermost workpiece;

said reciprocating means including a movable plate disposed on said base plate; a first pair of opposed gripping jaws mounted on said movable plate and means for reciprocatingly moving said movable plate, said first pair of jaws grasping the lowermost workpiece associated with said pin and then removing the workpiece from said receiving station;

said pin including first cam surface means integral therewith, said movable plate including first cam means integral therewith for engaging said first cam surface means to depress said pin into said second opening against the biasing of said spring means when said movable plate moves said first pair of jaws past said pin, so that the lowermost workpiece is free from said pin and may be grasped by said first pair of jaws and removed from said receiving station;

said transfer means including an actuator having an axially movable piston rod that has a selected dimension so that a free end thereof may be received in one end of the tubular workpiece, said piston rod dimension permitting said piston rod to pass between said first pair of jaws and to pass through said first opening in said base plate so that the workpiece may be transported to said cutting means, said piston rod dimension further permitting said piston rod to pass through a third opening in said base plate so that the threaded workpiece may be removed from said cutting means to a surface of said base plate;

said discharge means including a second pair of opposed, spring biased jaws on said movable plate in association with said third opening, said second pair of jaws being arranged to grip the workpiece after the threads are cut thereon and after the workpiece is removed from said cutting means, the threaded workpiece being retained in said third opening and moved with said movable plate along said surface of said base plate to a discharge area.

4,030,154

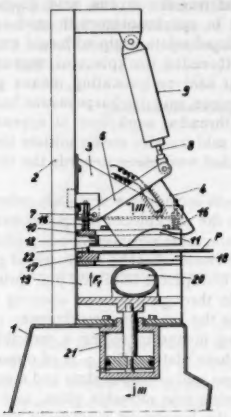
MACHINE FOR PREFORMING SHOE UPPERS

Andre Paul Edouard Fromantin, 37, rue Caulaincourt, 75011 Paris, France

Filed Dec. 9, 1975, Ser. No. 639,188
Claims priority, application France, May 21, 1975, 75.15758
Int. Cl.² A43D 11/00
U.S. Cl. 12—54.1 9 Claims

1. In a machine for preforming shoe uppers, in combination, a mold, a frame, a lever articulated on said frame and supporting said mold, a notched platform being supported under said mold, a notched plate being supported under said platform and on which the upper to be formed is to be positioned, a movable box supporting said plate, an elastically deformable

member being positioned in the center of said box, means capable of pivoting said lever and causing said mold to pivot

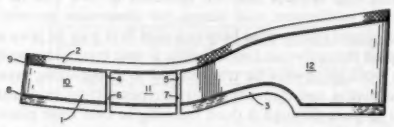


through the notches in said platform and said plate and means capable of displacing said box towards said plate.

4,030,155
CLOG SOLE

Jacques Azadian, 84 N. Adams St., Manchester, N.H. 03104, and Albert J. Arsenault, P.O. Box 571, Bethlehem, N.H. 03574

Filed Aug. 24, 1976, Ser. No. 717,256
Int. Cl.² A43D *00/00*; A43B *1/06*
U.S. Cl. 12—146 B **8 Claims**



1. A method of manufacturing a segmented clog sole comprising:

a. forming a unit sole having at least two slots on the upper side thereof running across the width of said unit sole perpendicular to the longitudinal axis thereof, one of said slots being approximately in the area of the ball and the others being forward thereof towards the toe;

b. applying with an adhesive a mid sole to the upper side of said unit sole over said slots and an outer sole to the bottom side thereof; and

c. cutting said unit sole and outer sole completely through from the side of said outer sole into said slots with the cuts being in register with and in number corresponding to said slots.

4,030,156
BRIDGE EXPANSION JOINT

Paul J. Raymond, Troy, N.Y., assignor to A. J. Harris & Sons, Inc., New Britain, Conn.

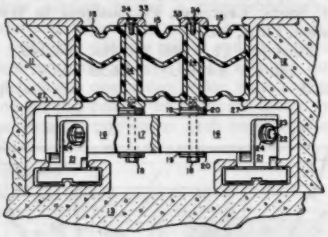
Filed Aug. 16, 1976, Ser. No. 714,853
Int. Cl.² E01D *19/06*
U.S. Cl. 14—16.5 **17 Claims**

13. An expansion joint for use in a gap between pavement sections comprising:

at least one beam running longitudinally in the gap and having a wearing surface substantially coplanar with the wearing surfaces of the pavement sections;

a resilient seal between each pair of beams and between each beam and the end of a pavement section;

at least a pair of proportioning bars, said bars extending across the gap at an acute angle with the general line of direction of the gap;



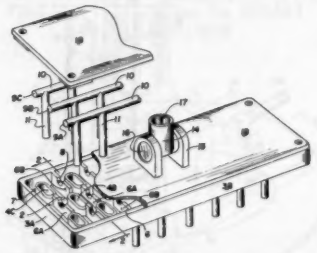
a glide channel formed in the ends of each of the pavement sections being joined and defining the permissible motion of an end of each of the proportioning bars as substantially linear in the general line of direction of the gap;

means for slidably mounting the ends of the proportioning bars in the glide channels.

4,030,157
RAKE DEVICE

Claude W. Seymour, 8401 Delido Road, Louisville, Ky. 40219

Division of Ser. No. 410,289, Oct. 26, 1973, Pat. No. 3,913,169. This application Sept. 8, 1975, Ser. No. 597,698
Int. Cl.² A47L *13/00*
U.S. Cl. 15—142 **2 Claims**



1. A rake means including: base (means) member including a bottom member having selectively spaced apertures of selected width; a multiplicity of elongated spaced tooth members of mean width (diameter) less than the (diameter) width of said apertures and pivotably secured at a first end in said base member (means) and disposed to extend outwardly from said bottom member through said apertures so each said tooth member can pivotally move in a selected direction limited by the (periphery) ends of said aperture wherein said tooth members are arranged to provide a multiplicity of rows of tooth members extending outwardly from said base member (means) whereby said tooth members contact a surface to be raked and pivot from a first position to a second position as said base member (means) is moved first in one direction then in an opposite direction over said surface to be raked.

4,030,158
HAIR BRUSH

Michael A. Blair, and Robert M. Hoffman, both of Los Angeles, Calif., assignors to Advance Design Laboratories, Inc., Los Angeles, Calif.

Filed June 3, 1976, Ser. No. 692,292
Int. Cl.² A46B 9/02
U.S. Cl. 15—159 A **3 Claims**

1. A hair brush particularly for use in blow waving comprising:

a substantially rigid elongated plastic brush block having a front surface and a back surface and having an integral longitudinally extended handle extending from one end thereof, said brush block having a solid continuous peripheral rim having first and second substantially parallel side portions and first and second end portions and a plurality of substantially identical, substantially equally spaced, substantially parallel rib portions laterally joining said side portions of said rim, each of said parallel rib portions being sharply arched towards the same one of said end portions with the apex of its arch being positioned at the midpoint of each rib portion, said rib portions defining arcuate apertures therebetween for permitting air to be freely blown through said brush block.

a first plurality of folded plastic single bristles formed of thermoplastic material and mounted in the front surface of said brush block at substantially uniform spacing from each other around said peripheral rim of said block;

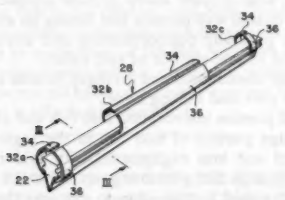
a second plurality of folded plastic single bristles formed of thermoplastic material, said second plurality of bristles being laterally unaligned with said first plurality of bristles and being mounted in the front surface of said block at substantially uniform spacings from each other along said sharply arched ribs and following the arch of said ribs to laterally subdivided the longitudinal spacing between said first plurality of brushes, whereby in a lateral projection of all of said bristles, the longitudinal spacing between bristles is substantially less than the spacing between said first plurality of bristles, and all the bristles present a much greater lateral surface area than the lateral surface area of said first plurality of bristles;

and each of said bristles being folded at a point beyond its midpoint to provide one long flexible strand and one shorter substantially stiffer strand.

4,030,159
WINDSHIELD WIPER BLADE LINER

Nicholas J. Centoducati, 2142 Cayuga Drive, Merrick, N.Y. 11566

Filed Oct. 6, 1975, Ser. No. 620,162
Int. Cl.² B60S 1/38
U.S. Cl. 15—250.42 **5 Claims**



1. A windshield wiper blade and a liner therefor made of a synthetic polymeric material comprising:

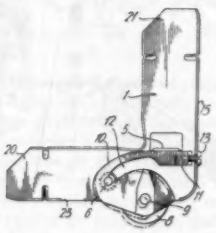
a windshield wiper blade having a wiping tip at one extremity thereof and connected adjacent the other extremity thereof to the yoke of an oscillatable wiper arm;

and a liner for said balance comprising a pair of side walls having a spring-like resiliency and extending upwardly in spaced diverging relation from a converged end portion forming a wiping tip and terminating in a plurality of longitudinally spaced upper elements including pairs of first and second opposed lever arms which encircle said other extremity of said blade and connected yoke in spaced relation, said side walls being spaces so as to enclose said windshield wiper blade therebetween and be normally biased against said wiper blade to be releasably retained thereon, the outer free ends of said opposed lever arms being pivotable to thereby flex said side walls to effect the removal of accumulated ice and snow therefrom and to selectively mount the liner on and remove the liner from the wiper blade.

4,030,160
CORNER BRACKET AND ROLLER ASSEMBLY FOR SLIDING DOORS

Martin R. Lambertz, New Hamburg, and Maria Fiorelli, Kitchener, both of Canada, assignors to The Stanley Works, Hamilton, Canada

Filed July 19, 1976, Ser. No. 706,389
Claims priority, application Canada, Aug. 19, 1976, 233744
Int. Cl.² E05D 13/02
U.S. Cl. 16—105 **12 Claims**



1. A corner bracket and roller assembly for a sliding door comprising:

a. a corner bracket having integral first and second arms at right angles adapted for insertion into frame members of said door; said first arm having an aperture in the bottom edge thereof; said second are having an outside edge adjacent said aperture;

b. first pivot means secured in a plane perpendicular to said first arm and spaced from said second arm; and

c. a roller assembly comprising

i. a housing,

ii. a roller,

iii. second pivot means mounting to said roller in said housing, and

iv. an elongated resilient member connected to said housing and including an adjustment means; said housing being inserted into said corner bracket, for pivotal mounting on said first pivot means such that said roller is adjustably and resiliently extended through said aperture of said first arm adjacent said outside edge of said second arm, with said second pivot means intermediate said first pivot means and said outside edge of said second arm, and wherein said adjustment means is adjusted through an aperture in said second arm.

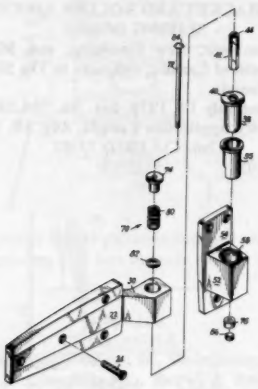
4,030,161
SELF-CLOSING SPRING HINGES

Frank F. Loikitz, Middletown, N.J., assignor to Buildex Incorporated, Huntington, N.Y.

Filed Oct. 29, 1976, Ser. No. 737,138
Int. Cl.² E05F 1/12
U.S. Cl. 16—186 **11 Claims**

1. A hinge comprising support means, stationary cam means fixed to and carried by said support means, movable means, turnable cam means fixed to and carried by said movable

means, said stationary cam means cooperating with said turnable cam means to guide the latter for turning movement with respect to said stationary cam means about a predetermined hinge axis, said stationary and turnable cam means respectively having mating camming surfaces which are inclined with respect to said axis, mounting means fixed to said support means for mounting the latter on a stationary part with said camming surface of said stationary cam means situated beneath said camming surface of said turnable cam means and with said axis having a substantially upright attitude, said movable means carrying a connecting means for connecting to



said movable means a turnable part which is to turn with respect to said stationary part, and said camming surface of said turnable cam means riding upwardly and downwardly along said camming surface of said stationary cam means during opening and closing turning movement, respectively, of said movable means, and spring means engaging said movable means and urging the latter along said axis toward said stationary cam means so that opening movement of said movable means is carried out in opposition to said spring means while the weight of the turnable part and said spring means both act to urge said movable means to carry out a closing movement with respect to said support means and stationary cam means.

4,030,162

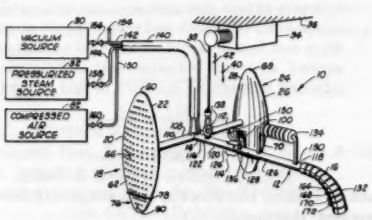
FOOD PROCESSING APPARATUS

James L. Hubbard, Rte. 1, Box 119,, Wewoka, Okla. 74884

Filed Apr. 7, 1976, Ser. No. 674,404

Int. Cl.² A22C *17/00*

U.S. Cl. 17—1 R **16 Claims**



1. An apparatus for removing leaf fat from the abdominal cavity of a hog carcass, comprising:

a first plate having a first face and a second face, the first face being engageable with a portion of the exposed surface of the leaf fat in a removal position of the first plate with respect to the leaf to be removed;

means connected to the first plate for positioning the first plate in the removal position with the first face engaging a portion of the leaf fat to be removed;

means connected to the first plate for severingly engaging a portion of the leaf fat in the removal position of the first plate, a portion of the leaf fat being severed from the hog carcass by said means in the removal position of the first plate for facilitating the removal of the leaf fat from the hog carcass; and

means connected to the first plate for maintaining an engagement between the first face of the first plate and a portion of the leaf fat in the removal position of the first plate while moving the first plate relative to the hog carcass for removing a portion of the leaf fat from the hog carcass.

4,030,163

CUTTER FOR REMOVING A TOUGH SURFACE LAYER FROM PIECES OF MATERIAL

Erik Laurits Reichstein, Frederikshavn, Denmark, assignor to Arenco AB, Vastra Frolunda, Sweden

Filed May 29, 1975, Ser. No. 581,834

Claims priority, application Denmark, May 31, 1974, 2966/74

Int. Cl.² A22C *25/02*

U.S. Cl. 17—50 **12 Claims**

1. A machine for skinning fish, comprising:

an elongated roller having a generally cylindrical surface;

an elongated stationary cutter positioned in the path of trvel of the fish and having a wall portion inclined in the direction generally opposite to the direction of travel of said fish toward said roller and disposed at an acute angle relative to a perpendicular extension to the surface of said roller, a cutting edge defined by said wall portion and adjacent said surface of said roller for severing and removing the skin from said fish, an arcuate lower portion adjacent said cutting edge and disposed adjacent said roller, said arcuate lower portion located at an obtuse angle to said wall portion and having an arcuate configuration generally complementing and disposed generally parallel to said surface of said roller;

said roller constructed and arranged to feed said fish to said cutter past said cutting edge;

said wall portion intercepting said fish and urging the leading edge portion of said fish in the region of said skin toward and into engagement with said roller and said cutting edge for promoting severance of said skin and enabling said cutting edge to cut into the fish adjacent said skin; and

said cutting edge cooperating with said roller for guiding said severed skin between said cutter and said roller and for guidably lifting the remainder of said skinned fish above said cutter.

8. A method of skinning fish, comprising the steps of:

providing an elongated roller having a generally cylindrical surface;

providing an elongated cutter having a wall portion inclined in the direction generally opposite to the traveling direction of said fish toward said roller, a cutting edge defined

by said wall portion, and an arcuate lower portion adjacent said cutting edge with said arcuate lower portion located at an obtuse angle to said wall portion and having an arcuate configuration generally complementing said surface of said roller;

feeding fish via said roller to said cutter past said cutting edge by advancing the fish to intercept said wall portion substantially prior to severing the skin from said fish with said cutting edge;

positioning said cutter in the path of travel of the fish, including positioning said wall portion at an acute angle relative to a perpendicular extension to said surface of said roller, positioning said cutting edge adjacent said surface of said roller and positioning said arcuate lower portion adjacent and generally parallel to said surface;

forcing the leading edge of said fish in the region of said skin toward and into engagement with said cutting edge;

cutting the fish adjacent said skin with said cutting edge so as to remove said skin from said fish;

guiding said severed skin between said cutter and said roller; and

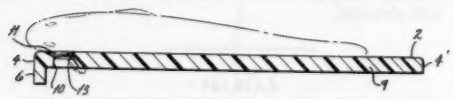
lifting the remainder of said skinned fish above said cutter; said wall portion enhancing continued cutting of said fish.

4,030,164

RETENTION DEVICE FOR FILLETING FISH

Henry A. Fick, 5138 Kempf, St. Louis County, Mo. 63128

Filed July 3, 1975, Ser. No. 593,039
Int. Cl.² A22C *25/00*
U.S. Cl. 17—70 **11 Claims**



1. A device for retaining a fish during filleting operation thereon comprising a rigid, flat, elongate body having a forward end portion and a rearward end portion, the length of said body being commensurate with that of the fish to be accommodated for supporting same thereon upon one of the sides of the fish; means provided on said body for engaging the fish to be filleted to maintain same against displacement during filleting, said means consisting essentially of an opening provided within the forward end portion of said body, said opening being of curvate configuration with forward and rearward edges having the central portions thereof in spaced-apart, confronting relationship, said front and rear edges merging rearwardly of the central portion of said rearward edge, said opening having the bight thereof extending forwardly of said body, the curvature of said opening substantially corresponding to the anterior edge of the external gill openings of the fish to be filleted, said body opening being dimensioned for extension therethrough of the adjacent external gill opening or operculum of the fish, and with said opening rearward edge presented for projection within the gill ports of the adjacent gill opening whereby a secure fish-retaining engagement is effected by said body.

4,030,165

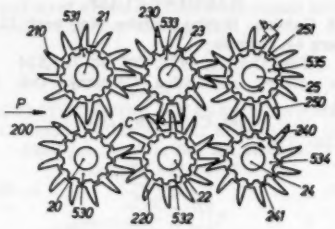
DEVICE FOR DRAFTING LONG STAPLE FIBRE SLIVER

Ludwig Schmitt, Manching, and Joachim Kipping, Ingolstadt, both of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Continuation of Ser. No. 353,713, April 23, 1973, abandoned, which is a continuation of Ser. No. 139,629, May 3, 1971, abandoned. This application May 17, 1974, Ser. No. 471,016
Claims priority, application Germany, May 8, 1970, 2022482
Int. Cl.² D01G *31/00*; D01H *5/24*
U.S. Cl. 19—.2 **3 Claims**

1. In apparatus for drafting long staple fibre slivers including a first pair of drafting rollers, a second pair of drafting rollers spaced from said first pair of drafting rollers, a pair of guiding rollers located between said first and second pairs of drafting rollers for positively guiding fibre slivers along a substantially linear path between the drafting roller pairs, the improvement comprising:

each of said guiding rollers having pointed substantially radial projections arranged in generally longitudinal rows, the outer ends of said projections of one row of projections carried on one of said guiding rollers projecting radially inwardly and between the outer ends of said projections of two adjacent rows of projections carried on said other guiding roller when the projections of said guiding rollers are in fiber sliver penetrating position,



said adjacent projections of each row of projections carried on said rollers being circumferentially spaced substantially less than the pitch between corresponding teeth of adjacent rows producing a helical configuration of teeth,

each of said projections on said one guiding roller being longitudinally spaced from a substantially corresponding located projection on said other guiding roller,

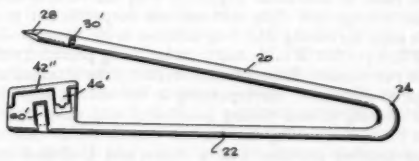
a drive sprocket carried by each roller, and endless loop drive means positively engageable with the roller drive sprockets for driving said rollers at constant angular velocity without backlash and thereby maintaining such offset relationship of the adjacent sliver-penetrating projections of said two rollers.

4,030,166

SAFETY PIN

Paul D. Betters, 60 Main St., Oakfield, N.Y. 14125

Filed Dec. 5, 1975, Ser. No. 638,108
Int. Cl.² A44B *9/14*
U.S. Cl. 24—156 R **3 Claims**



1. A reusable safety pin formable in a single plastic injection molding, said safety pin comprising a free shaft having a first end with an indentation on one side only of said shaft adjacent said first end, a fixed shaft connected at one end by a resiliently flexible portion to the second end of the free shaft, and a head assembly connected to the second end of the fixed shaft, said head assembly including a back wall with a mold opening therethrough and with a resilient projection integrally formed with the back wall and extending above the back wall, a rear wall integral along one edge with said back wall and extending upwardly from said back wall, a tab extending inwardly from said rear wall and over said mold opening in said back wall, said tab positioned above said back wall at a height approximately equal to the thickness of said first end of said free shaft to provide a receiving slot for said free shaft,

said tab including a downwardly projecting protrusion positioned over said mold opening and engageable with said indentation on said free shaft when said free shaft is inserted under said tab, said protrusion preventing axial movement of said free shaft, said resilient projection on said back wall positioned adjacent the free shaft when the free shaft is positioned in said receiving slot to increase the force required to remove the free shaft from the receiving slot thereby providing a reusable safety pin formable in a single injection molding without requiring the use of movable cores during the injection molding process.

4,030,167

GARMENT CLASP

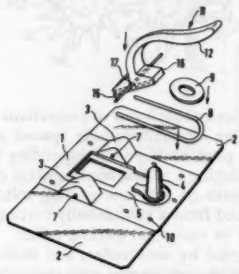
Christoph Gubbels, Wellingsbutteler Weg near 32, D-2000 Hamburg 64, Germany

Filed Oct. 12, 1976, Ser. No. 731,534

Claims priority, application Germany, Oct. 9, 1975, 2545302

Int. Cl.² A44B *17/00*

U.S. Cl. 24—210 **6 Claims**



1. A garment clasp construction which includes: a base plate, bearing block means arranged on said base plate and located in spaced substantially parallel relationship to each other, a longitudinally extending substantially L-shaped clasp member having a foot portion with a bearing pin laterally protruding from both sides of said foot portion and extending in a direction transverse to the longitudinal extension of said clasp member, said laterally protruding portions of said bearing pin being pivotally journalled in said bearing block means to permit shifting said clasp member selectively from a first position representing the open position of said clasp member to a second position representing the closing position of said clasp member, and vice versa, stud means mounted on said base plate in substantial alignment with the vertical central plane through said clasp member and perpendicular to said base plate for resting said clasp member in its closed position, said foot portion of said clasp member being provided with at least two channel-shaped detent recess means arranged at an angle to each other corresponding to the shifting angle from said opening to said closing position of said clasp member, said base plate having that surface thereof which faces said clasp member provided with a recess, and U-shaped spring means fastened onto said stud means and arranged in said recess, the legs of said U-shaped spring means being preloaded for engaging said detent recess means.

4,030,168

METHOD AND APPARATUS FOR TRAVERSING A STRAND TO FORM A RESTRAINED WEB

Paul Morrison Cole, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 652,658, Jan. 27, 1976, abandoned. This application Aug. 27, 1976, Ser. No. 718,338

Int. Cl.² D04H *3/04, 3/05*

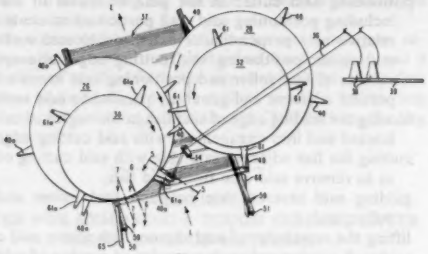
U.S. Cl. 28—101 **10 Claims**

1. An apparatus for traversing a strand between two spaced rows of strand-restraining elements moving together in the same direction at the same speed in the same plane to form a web, said apparatus comprising:

a strand supply source;

a guide located out of the plane of said rows and between them for receiving the strand from said supply source;

at least one pair of rotatable strand-engaging members associated with each row of strand-restraining elements for slideably engaging the strand between said guide and



said plane and traversing said strand toward one and then the other row while forming a loop in said strand during each traverse and bringing said loop into a plane substantially parallel to the plane of the rows of strand-restraining elements and beyond said rows; and

means for disengaging said loop from said strand-engaging members beyond said rows of strand-restraining elements and depositing the strand in a loop around at least one of said elements.

4,030,169

METHOD AND APPARATUS FOR TREATING YARN

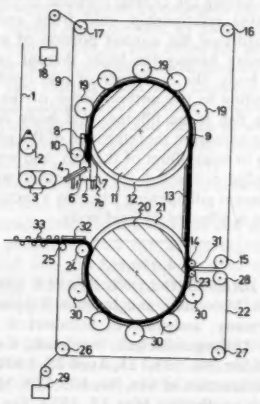
Heinrich Enneking, Karlsruhe; Günter Schubert, Malsch, and Karl-Heinz Baumann, Karlsruhe, all of Germany, assignors to Industriewerke Karlsruhe Augsburg Aktiengesellschaft, Germany

Filed Feb. 11, 1976, Ser. No. 657,218

Claims priority, application Germany, Feb. 22, 1975, 2507752

Int. Cl.² D02G *1/20, 1/16, 1/12*

U.S. Cl. 28—220 **14 Claims**



7. An apparatus for treating yarn comprising means defining a continuous heating chamber, means defining a continuous cooling chamber adjacent said heating chamber, means for stretching and feeding yarn to be treated toward said heating chamber, crimping means along the feed path of the yarn for crimping the yarn, means adjacent said crimping means for

forming the crimped yarn into a wadding, mechanical means for positively advancing the wadding through said heating chamber and said cooling chamber, means associated with said heating chamber for compressing the wadding as it is moved therein so that it is transferred in a compressed state through a portion of said heating chamber and said cooling chamber, means in said heating chamber for heating said wadding and means in said cooling chamber for cooling said wadding.

4,030,170

FELTING NEEDLE

Hellmuth Eckhardt, Herzogenrath, Germany, assignor to Torrington GmbH, Wurselen, Germany

Filed Apr. 15, 1976, Ser. No. 677,502

Claims priority, application Germany, Apr. 23, 1975, 2518066

Int. Cl.² D04H *18/00*

U.S. Cl. 28—115 **8 Claims**

1. A felting needle comprising: a needle shaft with at least one barb formed on the shaft and a groove between the barb and the shaft, the groove being defined by a bottom surface, the inside surface of the barb, and a throat serving as a transition between the bottom surface and the inside surface of the barb, the bottom surface, inside surface of the barb, and the throat all being completely rounded in such a manner that no plane surfaces remain, and that said surfaces merge into each other and into the needle shaft without sharp edges.

4,030,171

TANDEM TRAILER SYSTEM

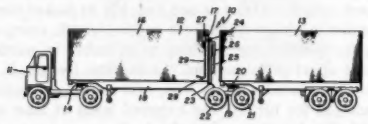
Gerard A. Arguin, 3 Valley St., Spencer, Mass. 01562

Division of Ser. No. 528,786, Dec. 2, 1974, Pat. No. 3,933,374, which is a continuation of Ser. No. 370,744, June 18, 1973, abandoned. This application Jan. 15, 1976, Ser. No. 649,369

The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.² B62D *53/08*

U.S. Cl. 280—408 **1 Claim**



1. A trailer unit to be towed behind a highway tractor, and behind which may be towed another trailer, the trailer unit comprising

a. a cargo container,

b. a chassis on which the container is mounted, the chassis having a first and a second end, a portion of the chassis associated with the second end extending downwardly and rigidly beyond an end of the cargo container,

c. first attaching means associated with the first end of the chassis by which the chassis can be connected to a highway tractor,

d. a second attaching means associated with the portion of the chassis which extends beyond the end of the cargo container, by which another standard trailer can be attached to the chassis, the second attaching means being entirely below a horizontal plane which includes the lowest portion of the cargo container and at the level of the first attaching means,

e. a first set of wheels attached to the said portion of the chassis, at a point where the set is at least as far away from the first end as the second attaching means, an entrance to the cargo container being provided facing toward and adjacent the second end of the chassis, and

f. a second set of wheels attached to the chassis between the first end and the first set of wheels.

4,030,172

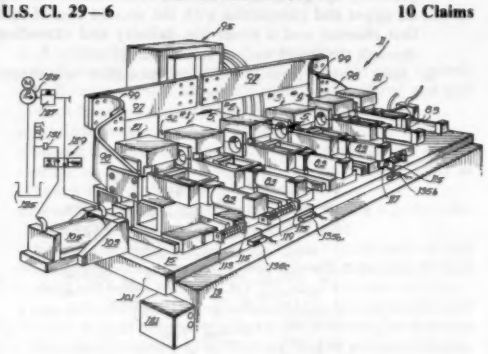
CRANKSHAFT-FORMING APPARATUS AND METHOD

Elvin O. Gentry, 1419 Towanda St., Bloomington, Ill. 61701

Filed July 8, 1976, Ser. No. 703,621

Int. Cl.² B21K *1/08*

U.S. Cl. 29—6 **10 Claims**



1. Apparatus for forming crankshafts from metal rod, including a base, a pair of units for holding a metal rod to be formed at locations near the ends thereof, which holding units are movable in a direction axially of the rod, means for electrically heating the metal rod to a temperature sufficient to permit its deformation, a plurality of forming units which include forming heads designed to be clamped about the rod at precise locations therealong between said holding units, means for moving said forming heads in a direction transverse to the axis of the rod and control means for moving said forming heads of different units in different directions, wherein the improvement comprises said forming units being mounted on individual carriages which are axially movable along said base, each of which carriages supports a subcarriage for movement on said carriage along a first line transverse to said axis plus a first motor for so moving said subcarriage, each of said subcarriages supporting one of said forming heads plus a second motor for moving said head along a second line transverse to said axis with the direction of movement along said second line being generally perpendicular to the direction of movement along said first line.

4,030,173

PIN HANDLING AND INSERTION MECHANISM

Jodie W. Phillips, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 26, 1976, Ser. No. 708,499

Int. Cl.² H01J *9/24*

U.S. Cl. 29—25.19 **10 Claims**

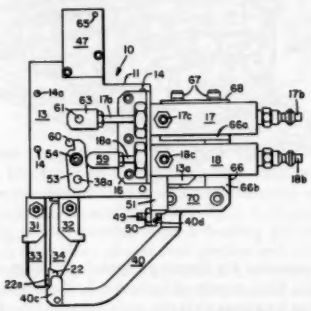
1. In the manufacturing of face plates for color television picture tubes each having inserted, in one surface thereof for

support of an aperture mask adjacent to such surface, an end of at least one of a plurality of relatively elongate pins each having a U-shaped channel cross-sectional configuration taken on a plane normal to the length thereof; and, in combination with a heating means intermittently disposed adjacent said one surface of each of said face plates, a mechanism for handling said plurality of pins and intermittently positioning each said pin adjacent said heating means for heating thereof and subsequent insertion of its end into said one surface of the respective face plate adjacent with such heating means is then disposed, said mechanism comprising;

A. a housing member disposed above said heating means, such housing member embodying;

I. a first pin guide channel having a height greater than the length of each of said pins and extending generally horizontally in said housing, a second pin guide channel for conveyance of each of said pins in a generally upright position thereof such channel having a lower end connecting with a first end of said first channel and an upper end extending through the upper wall of said housing for receipt of each of said pins, and a third pin guide channel for conveyance of each of said pins in a generally upright position thereof such channel having an upper end connecting with the second end of said first channel and a lower pin delivery end extending through the lower wall of said housing; and

II. slide means arranged for reciprocative movement



between first and second positions in said first channel for receipt and conveyance of each of said pins in said generally upright position thereof from said lower end of said second channel to said upper end of said third channel for delivery of the pin to such end of such third channel;

B. a pair of facing and generally vertically extending jaws having upper ends disposed adjacent said lower pin delivery end of said third channel, such jaws being actuable between first spaced-apart positions for receipt, between the upper ends of the faces thereof, of each of said pins delivered thereto from said third channel lower delivery end, and second positions for clamping part of each received pin therebetween, the face of one of said jaws having a width generally corresponding to and slightly smaller than that of the channel in each of said pins for sliding movement and guidance of such pins along such one jaw from said upper to said lower ends of said faces of the jaws for said clamping of said part of each of the pins therebetween;

C. stop means arranged for reciprocative movement between a first position substantially away from said jaws for clearance thereof and a second position adjacent and below the lower ends of said jaw faces for precisely limiting the distance each of said pins can extend downwardly from between said faces prior to said clamping of each of the respective pins;

D. resilient means for force biasing said jaws to their said second positions;

E. first motor means for imparting said reciprocative movements to said slide means and said stop means for simultaneous movement thereof from their said first positions to their said second positions and from their said second positions to their said first positions; and

F. second motor means reciprocatively actuable between two positions and associated with said jaws for movement thereof and their said faces away from each other for receipt of each of said pins therebetween when such motor means are actuated from one to the other of their said two positions against the force of said resilient means, such resilient means again force biasing said jaws to their said second positions when the second motor means are actuated from said other to said one of their said two positions.

4,030,174

INSTALLATION FOR PREPARING CABLE LENGTHS FOR PLUG EXTRUSION

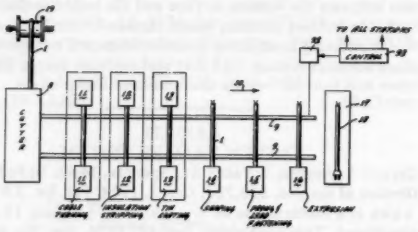
Karl Büttner; Jürgen Böll, and Kurt Wölfel, all of Nuremberg, Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Division of Ser. No. 605,748, Aug. 18, 1975, Pat. No. 3,999,289. This application Oct. 13, 1976, Ser. No. 732,067

Claims priority, application Germany, Aug. 22, 1974, 2440264

Int. Cl.² B23P *23/04*

U.S. Cl. 29—33 M **11 Claims**



1. In an apparatus for providing a plug element by means of extrusion to the end of a length of electrical cable having a plurality of leads and wherein each such length has to be prepared prior to extruding said element, and wherein a portion of each length, at least at one end, has its jacket removed to expose the insulated leads for a certain length, comprising:

means for positioning the lengths of cable in particular, spaced apart positions and moving the lengths in steps through a plurality of stations, said stations including:

means (a) for turning the exposed leads at least at one end of a length, so that the leads assume a predetermined orientation for and during the continuation of moving the length to the next and other stations;

means (b) for stripping the insulation of a portion of the leads as oriented to expose the wire;

means (c) for strengthening the tips of the exposed wires;

means (d) for shaping the lead ends with exposed and strengthened wire to assume an orientation and a disposition flush with the position of prongs in the completed product; and

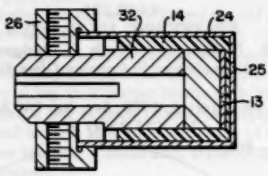
means (e) for connecting the prongs to said wires.

4,030,175

METHOD OF MAKING A METAL ENCLOSED TRANSDUCER ASSEMBLY

James L. McShane, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 603,708, Aug. 11, 1975, Pat. No. 3,979,565. This application Apr. 6, 1976, Ser. No. 674,182
Int. Cl.² H01L 41/22
U.S. Cl. 29—25.35 1 Claim



1. A process for manufacturing transducer apparatus including (a) an element assembly comprising an active piezoelectric member, a backup member and a base member united to said piezoelectric member and backup member, and electrical leads for said piezoelectric member passed through said base member, (b) a support for said base member, (c) a metallic capsule having a window wall interposed in the line of transmission of acoustic waves between said piezoelectric member and a transmitting medium, and (d) an epoxy resin for uniting said metallic capsule, said element assembly and said support comprising the steps of:

pouring epoxy resin in said capsule;

placing said element assembly in predetermined geometric relation to said capsule;

curing said epoxy resin in situ to unite said base member, said backup member, said piezoelectric member and said capsule;

placing said support in abutting relation to said capsule;

with fixture means being provided for placing said element assembly in predetermined geometric relation to said capsule, said fixture means being mounted on said element assembly before said step of pouring, and being removed therefrom after said step of curing; and

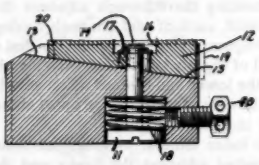
welding said capsule to said support in situ.

4,030,176

ADJUSTABLE CUTTING TOOL

Ronald E. Michonski, Rochester, Mich., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,458
Int. Cl.² B26D 1/00
U.S. Cl. 29—96 7 Claims



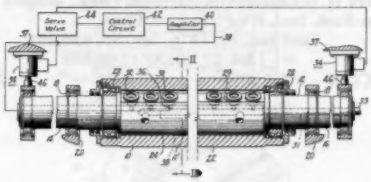
1. A cutting tool comprising a toolholder having a recess to receive an adjustable cartridge and an adjustable cartridge therein, said cartridge comprising a body member adapted to hold a cutting insert at one end, and an adjusting wedge member slidable mounted in a corresponding recess in said body member, rotatable eccentric means mounted in and extending through said body member and said wedge for holding said body member and said wedge member together and for effecting lateral movement of said adjusting wedge member relative to said body member means for holding said cartridge in said toolholder and means for longitudinally positioning said cartridge in said toolholder recess.

4,030,177

CONTROLLED DEFLECTION ROLL

Peter Hold, Milford, Conn., assignor to USM Corporation, Boston, Mass.

Continuation of Ser. No. 583,860, June 4, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 725,870
Int. Cl.² B21B 13/02
U.S. Cl. 29—116 AD 6 Claims



1. A controlled deflection roll comprising:

a shaft having a support arrangement near the ends thereof;

a shell roll journaled about said shaft, said shell roll and said shaft having a radial space therebetween;

a pressure sensor disposed within said shaft;

a biasing arrangement disposed near at least one end of said shaft to apply a bending moment across said shaft in response to a signal from said sensor;

at least two radially directed cylinders having a piston disposed therewith and spaced in said shaft;

a hydrostatic bearing pad on the outer end of each of said radially directed pistons facing the inside surface of said shell roll; and

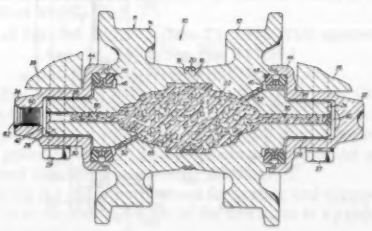
a manifold circuit arrangement extending through said shaft from at least one end thereof for conducting pressurized fluid to the vicinity of each of said radially disposed cylinders and pads, said conduit arrangement permitting pressurized fluid to be directed to said piston and bearing arrangement against the inner surface of said shell roll to help control deflection therein.

4,030,178

METHOD OF MANUFACTURING TRACK ROLLER WITH OPEN CELL PLASTIC FOAM IN LUBRICATION CAVITY

Leroy Luebkemann, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Division of Ser. No. 491,768, Aug. 6, 1974, Pat. No. 3,955,646. This application Aug. 4, 1975, Ser. No. 601,669
Int. Cl.² B21D 53/10
U.S. Cl. 29—149.5 NM 3 Claims



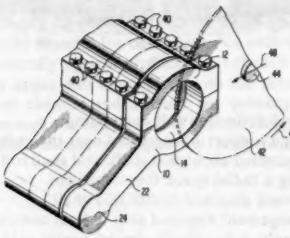
1. A method of manufacturing a track roller comprising the steps of: providing a track roller having a lubrication cavity

therein and at least one passage communicating with said lubrication cavity and accessible from the exterior of said track roller; providing a substance capable of foaming to form a solidified mass of open cell foamed material; supplying a sufficient quantity of said substance through said passage to said cavity wherein said substance foams in situ to form a solidified mass of said material which substantially fills said cavity and supplying a sufficient quantity of a lubricant under pressure through a passage to said cavity to saturate said solidified mass of material in said cavity.

4,030,179
METHOD OF MANUFACTURING LOW COST NON-POROUS METAL CONNECTING RODS

Leonard H. Schwarz, West Hartford, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Jan. 19, 1976, Ser. No. 650,401
Int. Cl.² B23P 15/00
U.S. Cl. 29—156.5 A 3 Claims

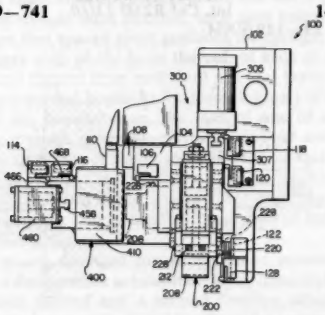


1. A method of manufacturing a series of dense, non-porous metal connecting rods comprising, in sequence, the steps of:
extruding semi-tubular metal bars having complementary edges and semi-circular recesses of equal diameter within the faces of said bars,
detachably joining said bars together at said complementary edges to form a rigid assembly defining a true circular opening therein running the complete length of said assembly, and
severing individual connecting rods from said assembly by sawing through said assembly at right angles to the axis of said joined semi-tubular metal bars such that each rod upon severance has a true circular opening formed by said joined portions of said bars.

4,030,180
LONGITUDINALLY FED COMPONENT INSERTION APPARATUS

Mark V. Pierson, 28 Ogden St., Binghamton, N.Y. 13901

Filed May 24, 1976, Ser. No. 689,249
Int. Cl.² H05K 3/30
U.S. Cl. 29—741 14 Claims

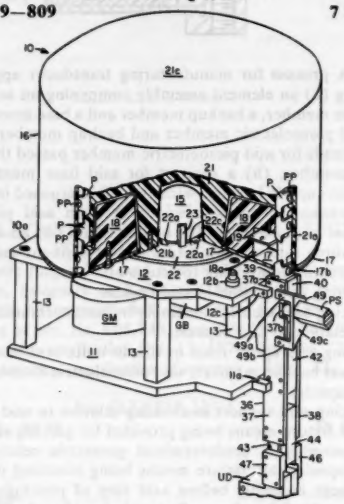


1. An apparatus for inserting electronic components whose leads are parallel and extend in the same direction substantially perpendicular to a planar surface of said component, said apparatus comprising:
component inserter means having a longitudinal axis;
drive means for rotating said inserter means between a feed position and a drive position and for reciprocating said inserter means from a first position to an insertion position along said longitudinal axis; and
feed means for feeding electronic components one at a time into said inserter means along said longitudinal axis when said inserter means is in said feed position.

4,030,181
PIN FEEDING MECHANISM

Lawrence W. Phillips, and Harris G. Rodgers, Sr., both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 6, 1976, Ser. No. 702,697
Int. Cl.² B23Q 7/10
U.S. Cl. 29—809 7 Claims



1. A mechanism for sequentially feeding to a utilization device each of a plurality of relatively elongate pins each having a U-shaped cross-sectional configuration taken on a plane normal to the length thereof and sides whose ends slope, at one end thereof, in directions parallel with each other, such mechanism comprising, in combination;
A. a cylindrical pin magazine including;
I. an outer main member embodying a plurality of elongate pin receiving channels aligned side-by-side with each other parallel with the length of said magazine and extending therethrough adjacent the outer periphery thereof, each of said channels having a cross-sectional configuration corresponding to that of one of said pins and of slightly larger size, such member having secured to the lower end thereof a first annular disk embodying a plurality of teeth spaced apart about the inner periphery thereof;
II. an inner annular member surrounded by said outer member adjacent the lower end thereof, such inner member having secured to the lower end thereof, above and slightly spaced from said first disk, a second annular disk extending under the lower ends of said channels in relatively close proximity thereto, such disk embodying in the outer periphery thereof a cut-out of a larger size than said cross-section of one of said channels in said magazine; and
III. a pin retention plate secured to said inner annular member adjacent the outer periphery thereof, such member extending outwardly partially over said cut-out in said second disk at a height slightly greater than the length of each of said pins;

B. a magazine support and drive assembly, such assembly including;

I. a support plate having means on the upper surface thereof for removably and precisely positioning said second annular disk thereon with said first annular disk slightly spaced from said upper surface of such support plate;

II. electric motor means including an output shaft extending upwardly through a suitable hole provided in said support plate; and

III. a generally cylindrical hub keyed to said output shaft for driven rotation therewith, such hub extending upwardly through the inner periphery of said first disk in a relatively snug but slidable relationship therewith and including a lug in a recess in the hub and normally spring biased out of such recess for engagement with one of said teeth in said inner periphery of the first disk for driven rotation thereof and, thereby, of said outer main member;

C. a pin feeding track assembly having an upper end attached to said support plate below said cutout in said second annular disk and a lower end attached to said utilization device, such assembly embodying pin guide channels extending vertically through the length thereof and providing a pin guide track for receiving at the upper end thereof pins released from said magazine and delivering at the lower end thereof such pins to said utilization device;

D. pin detection means disposed adjacent said pin guide track for detection of the passage of a pin moving through such track and actuating a pair of electrical circuit controlling contacts in response to such a detection; and

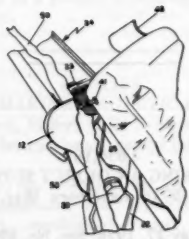
E. electrical circuit means, including said electrical circuit controlling contacts, for energizing said motor means to impart rotation to said main member of said magazine when a control signal is received from said utilization device and to interrupt such energization when said electrical circuit controlling contacts are actuated in response to said detection of a pin.

4,030,182

TAG APPLICATING DEVICE

Philip T. Wheeler, DeWitt, Mich., assignor to The Hardy Company, Lansing, Mich.

Filed Oct. 1, 1975, Ser. No. 618,453
Int. Cl.² B23Q 7/10
U.S. Cl. 29—816 **11 Claims**



1. A tag applicating device comprising:

a pair of crimping pliers; and

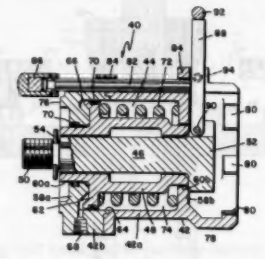
a tag receiving magazine coupled to said crimping pliers for holding a tag advanced from said magazine in position with respect to said crimping pliers such that a fastener positioned to be clamped by said crimping pliers engages the tag for attachment of the tag to an object.

4,030,183

TOOL ASSEMBLY FOR MOUNTING AND REMOVING OVERHUNG ROLLS

Raymond L. Smola, Holden, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Feb. 2, 1976, Ser. No. 654,219
Int. Cl.² B23P 19/02
U.S. Cl. 29—252 **14 Claims**



1. For use in combination with a work roll mounted on the end section of a shaft by means of a sleeve member inserted in an operative position therebetween, a fluid-actuated tool assembly for axially moving said sleeve member relative to said shaft into and out of said operative position, said tool assembly comprising: a cylinder movable axially relative to a piston, said tool assembly having oppositely disposed first and second ends, means at said first end for removably connecting said piston to said shaft with said cylinder positioned to abut said sleeve, means at said second end for removably connecting said cylinder to said sleeve with said piston positioned to abut said shaft, surface means on said piston and said cylinder for defining a fluid chamber, and means for admitting fluid under pressure into said chamber to produce axial movement of said cylinder relative to said piston, whereupon depending on which of the aforesaid ends of said tool assembly is operatively associated with said shaft and said sleeve member, axial movement of said cylinder relative to said piston will produce a desired axial displacement of said sleeve member relative to said shaft.

4,030,184

METHOD FOR STRIPPING WINDINGS FROM A STATOR

Frank R. Dombrowski, Kingston, and Raymond L. Larson, Sycamore, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 543,505, Jan. 23, 1975. This application Aug. 24, 1976, Ser. No. 717,293
Int. Cl.² B23Q 17/00; B26D 1/04
U.S. Cl. 29—403 **14 Claims**

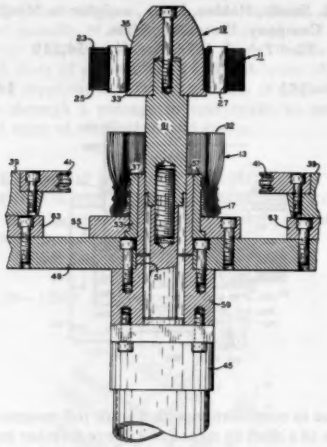
1. A method of stripping from a dynamoelectric machine stator a pluality of windings thereof having one of a pair of opposite generally annular groupings of end turns of the windings severed therefrom comprising the steps of:

a. lowering the stator onto means for seating and supporting it so as to dispose the other of the end turns in a predetermined position;

b. gripping the other end turns for maintaining them generally against displacement friom the predetermined position; and

c. driving the seating means generally upwardly relative to

the winding and moving the stator conjointly therewith toward a position displaced from the windings while



gripping the other end turns in the predetermined position thereby stripping the windings from the stator.

4,030,185

METHOD OF MANUFACTURING A BRAKE PAD ASSEMBLY FOR A SPOT-TYPE DISC BRAKE

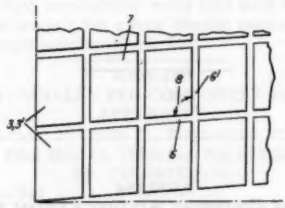
Heinz Gunter Hahm, Frankfurt am Main, and Nedo Igor Pocci, Neuenhain, both of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 577,149, May 13, 1975, abandoned. This application Sept. 29, 1976, Ser. No. 727,830

Claims priority, application Germany, May 14, 1974, 2423377

Int. Cl.² B23P *17/02*

U.S. Cl. 29—413 **2 Claims**



1. A method of manufacturing a brake-pad assembly for a spot-type disc brake having a carrier plate and a pair of friction pads comprising the steps of:

forming separately a pair of spaced recesses in said carrier plate, said recesses having a parallelogram configuration other than a rectangle and a cross member therebetween providing an axis of symmetry, said recesses being symmetrically disposed with respect to said axis of symmetry to approximate a sector of a circle;

pressing and age-hardening separately a plate of friction material having a thickness corresponding to the desired thickness of said pads;

cutting at least said pair of pads separately from said plate having the dimensions and shape of said recesses; and

placing and securing each of said pair of pads produced in said cutting step in a different one of said recesses so that said pair of pads are disposed symmetrically with respect to said axis of symmetry to approximate a sector of a circle.

4,030,186

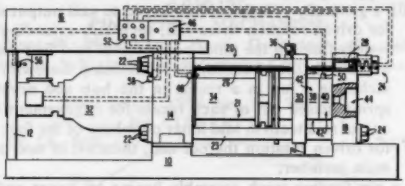
METHOD FOR FACILITATING ACCESS TO THE MOLD HALVES OF A MOLDING MACHINE

Gary L. Myers, and Donald W. Staiger, both of Mount Gilead, Ohio, assignors to HPM Corporation, Mount Gilead, Ohio

Division of Ser. No. 467,897, May 8, 1974, Pat. No. 3,951,579. This application Nov. 24, 1975, Ser. No. 634,593

Int. Cl.² B23P *19/02*

U.S. Cl. 29—427 **4 Claims**



1. A method of at least partially removing, from between the opposed stationary and movable platens of a molding machine, a tie rod which extends from a supportive structural frame freely through the movable platen to connection with the opposed stationary platen, said method comprising the steps of:

slidingly translating said movable platen toward said stationary platen freely along a plurality of independent tie rods connected to said stationary platen;

releasing at least one of said tie rods from connection with said stationary platen;

actuating a remote control mechanism connected to a power-actuated brake mechanism carried by said movable platen, to shift said brake mechanism into engagement with said one tie rod to connect said one tie rod to said movable platen for movement therewith;

slidingly translating said movable platen freely along those of said tie rods remaining connected to said stationary platen, to shift said one tie rod to a position away from said stationary platen;

actuating said remote control mechanism to shift said brake mechanism out of engagement with said one tie rod to disconnect said one tie rod from said movable platen;

slidingly translate said movable platen toward said stationary platen freely along said tie rods;

actuating said remote control mechanism to shift said brake mechanism into engagement with said one tie rod to connect said one tie rod to said movable platen for movement therewith; and

slidingly translating said movable platen freely along said remaining tie rods, to shift said one tie rod yet further away from said stationary platen.

4,030,187

METHOD OF MAKING AN OBJECT SUPPORT MEMBER

Thomas G. Daley, 9716 Lanesboro Way, Louisville, Ky. 40222

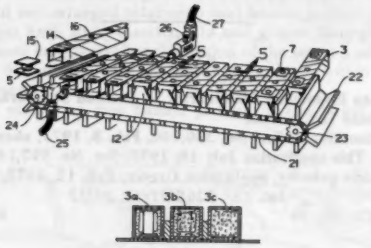
Filed May 27, 1976, Ser. No. 690,437

Int. Cl.² B23P *3/00, 25/00*

U.S. Cl. 29—458 **7 Claims**

1. A method for making a support for objects comprising the steps of: inserting into a conduit member at preselected positions therein inserts with openings therethrough, the axes of the opening and said conduit member being at right angles to one another; feeding a resilient foam mix into preselected portions of said conduit member to form a resilient foam support within said selected portions of said conduit member

and around said inserts; and, securing object mounting means at selected points of the foam filled said preselected portions



along the top outer surface of said conduit member for mounting an object thereto.

4,030,188
METHOD OF MAKING SHAKER PLATES

Dennis J. Reiland, St. Paul, Minn., assignor to General Pattern Co., Inc., St. Paul, Minn.

Filed June 11, 1976, Ser. No. 694,961
Int. Cl.² B22C *9/18*
U.S. Cl. 29—527.1 **7 Claims**

1. The method of making a metal shaker plate for removing flash sand from a sand core comprising the steps of:

placing a curing sand into a metal core box which is at a first temperature, heating the metal core box and the curing sand to a predetermined temperature to cure the sand and thereby produce a sand core, said metal core box undergoing a thermal expansion as a result of heating said metal core box to a predetermined temperature so that said sand core has extended dimensions which are equal to the internal dimensions of the metal core box when said metal core box is at the predetermined temperature;

forming a second core in said metal core box while said metal core box is maintained at the first temperature by use of a material that is characterized by an expansion of a predetermined amount upon setting which is greater than the thermal expansion of said metal core box;

using the second core as a pattern for casting a mold from a material which is characterized by a predetermined amount of shrinkage during the curing stage, said expansion of said second core and said contraction of said mold producing a dimensional compensation which is equal to the thermal expansion of said metal core box so that the mold has the same direction as the sand mold formed in said metal core box; and

using said mold as a pattern in making a shaker plate for said sand core.

4,030,189
METHOD OF MAKING MAGNETIC HEAD DEVICES

Jean-Pierre Lazzari, Villiers Saint Frederic, France, assignor to Compagnie Internationale pour l'Informatique, Louveciennes, France

Division of Ser. No. 444,495, Feb. 21, 1974, Pat. No. 3,975,771. This application Mar. 15, 1976, Ser. No. 666,566
Claims priority, application France, Feb. 21, 1973, 73.06006
Int. Cl.² G11B *5/42*
U.S. Cl. 29—603 **6 Claims**

1. A method of mounting a magnetic head in a carrier plate for operation as a flying shoe in magnetic disk equipment, said head being enclosed in an insulating non-magnetic material which is level with the airgap face of the magnetic structure of the head, said plate having front and rear faces, being formed of dielectric non-magnetic material and having a thru-hole from said front to said rear face for receiving said head, the steps comprising:

coating the side surfaces defining the thru-hole in said plate and said enclosed head with first and second films respectively of high permeability anisotropic material;

coating each of said magnetic films with a film of solder material having a melting point below said films of magnetic material and the insulating material enclosing said head;

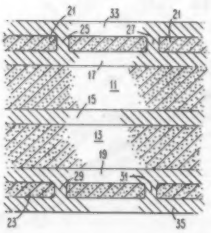
positioning said head within the thru-hole in said plate with the airgap face of said head level with said front face of said plate; and

temporarily heating the thus assembled parts to a temperature higher than the melting point of the said solder material while simultaneously supplying additional solder material between the facing solder films.

4,030,190
METHOD FOR FORMING A MULTILAYER PRINTED CIRCUIT BOARD

Kenneth James Varker, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,796
Int. Cl.² B41M *3/08*; H05K *3/08, 3/36*
U.S. Cl. 29—625 **13 Claims**



1. A method of manufacturing a multilayer printed circuit board including at least one base plane of inherently stable, conductive material and a plurality of signal planes, comprising the steps of:

adding first and second dielectric planes on the sides of said base plane;

creating first and second signal planes on said first and second dielectric planes, respectively;

adding third and fourth dielectric planes over said first and second signal planes, respectively; and

creating respective third and fourth signal planes on said third and fourth dielectric planes.

4,030,191
DEVICE FOR LINEARLY GUIDING A MACHINE ELEMENT

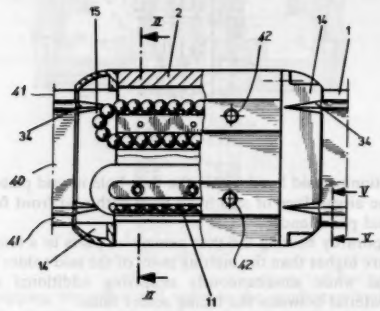
Horst M. Ernst, Eltingshausen; Armin Olschewski, Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed Mar. 4, 1976, Ser. No. 663,725

Claims priority, application Germany, Mar. 15, 1975, 7508272

Int. Cl.² F16C *29/12*

U.S. Cl. 308—6 C **15 Claims**



1. In a device for linearly guiding a machine element along a beam, wherein the beam and machine element define paths for two endless rows of circulating roll bodies on each side of the longitudinal median plane of the beam, the improvement wherein said beam has a center section joining a pair of end flanges, each end flange extending laterally of the beam on both sides of said longitudinal median plane, said machine element being positioned adjacent said flanges, a separate roll path for roll bodies under load being formed between said machine element and the inner edge of each said flange, said roll paths being positioned so that the force action lines on said roll bodies in the two roll paths on each side of the longitudinal median plane converge in the direction away from the respective side of said longitudinal median plane.

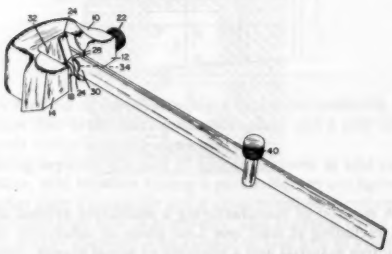
4,030,192
MAT CUTTER FOR CIRCLES

Franklyn G. Umholtz, Shutesbury, Mass., assignor to Russell Harrington Cutlery, Inc., Southbridge, Mass.

Filed May 25, 1976, Ser. No. 689,794

Int. Cl.² B26B *3/00*

U.S. Cl. 30—310 **5 Claims**



1. A mat cutter comprising a body, a blade, means mounting a shaft in the body, the shaft being threaded at one end with a nut thereon and free-ended at the opposite end, said opposite end having a generally side opening recess therein for the reception of the blade, said mat cutter including a wall against which the blade may be clamped by the shaft,

a radius rod, said radius rod having an opening therein for the reception of the free-ended portion of said shaft, said blade engaging the rod and holding it in position against said wall upon tightening of the nut on the shaft,

and a center point on the rod, said center point being adjustable therealong.

4,030,193
HAIRCUTTING MACHINE

Stephen Emmanuel Mandilaras, 31 Brilisou St., Turkovounia Athens 703, Greece

Continuation of Ser. No. 330,740, Feb. 8, 1973, abandoned. This application July 18, 1975, Ser. No. 597,159

Claims priority, application Greece, Feb. 12, 1972, 47476

Int. Cl.² B26B *21/12, 21/22*

U.S. Cl. 30—30 **8 Claims**

1. A hair cutting device comprising:

a. an elongated support having a handle member extending along an axis from one end thereof;

b. a plurality of spaced, elongated comb teeth extending outwardly and downwardly from opposite sides of said support and having free ends, said teeth on one side of said support being symmetrical with and having substantially the same length as the teeth on the other side, the arrays of teeth on the opposite sides of said support defining the legs of an arch;

c. elongated blade carrier means adapted to be selectively and adjustably positioned along substantially the entire length of the teeth on either side of said support, said blade carrier means extending parallel with and being spaced from said elongated support and having a width substantially less than the length of said teeth, and including a stud passing through and slidable within the space between adjacent teeth, and a means attached to said stud for clamping said carrier on the teeth at a selected location along the length thereof; and

d. a cutter blade on said carrier means, said blade having a cutting edge facing away from said support and being selectively adjustable with said carrier to different positions along said teeth from the ends thereof at the bottom of the arch legs formed by the arrays of teeth on the opposite sides of said support, to the upper ends of said teeth adjacent said support,

whereby the device may be moved over a portion of the user's body with the ends of said teeth at the bottom of said arch legs slidably engaging the user's body to cut hair thereon to the length determined by the position of said blade along said teeth, said arch legs serving to hold said cutting edge a fixed distance from and in a selected position relative to said surface.

4,030,194
NESTED HUNTING KNIFE

Lorenzo R. Hendricks, 9919 E. Apache Trail, Mesa, Ariz. 85207

Filed Sept. 9, 1976, Ser. No. 721,666

Int. Cl.² B26B *1/08*

U.S. Cl. 30—143 **13 Claims**

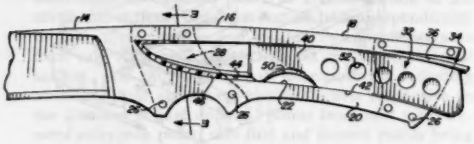
1. Hunting knife apparatus, comprising:

a larger knife having blade and handle portions, said handle portion having a groove extending longitudinally there-

along open at the end of said handle portion remote from said blade portion;

a smaller knife having blade and handle portions separate from those of said larger knife, said smaller knife configured and arranged relative to said handle portion of the larger knife to be inserted into said groove through said remote end of said handle portion of the larger knife and to be substantially completely received within said groove;

guide means on said handle portion of the larger knife



configured and arranged to guide said smaller knife longitudinally along said groove; and

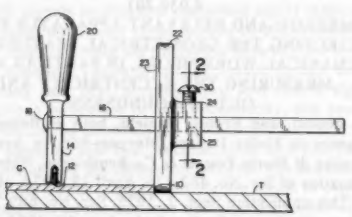
detent means carried by one of said larger and smaller knives and engageable with the other of said larger and smaller knives to retain said smaller knife within said groove, said detent means being disengageable to allow complete withdrawal of said smaller knife from said groove, said groove being open along a sufficient length of said handle portion of the larger knife to allow easy grasping of said smaller knife while within said groove to facilitate insertion and removal of the smaller knife.

4,030,195

SCORING DEVICE WITH EDGE GUIDE

Thomas A. Insolio, Bristol, Conn., assignor to The Fletcher-Terry Company, Farmington, Conn.

Filed Sept. 29, 1976, Ser. No. 727,765
Int. Cl.² B26B *3/08*; B26D *3/08*
U.S. Cl. 30—164.9 **6 Claims**



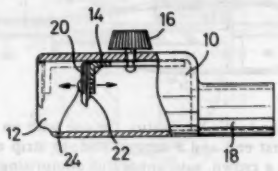
1. A device for manually scoring fracture sensitive sheet adjacent to one edge of the sheet and for guiding a scoring tool to keep it parallel the sheet edge, said device comprising a cam plate of irregular polygon shape having a plurality of guide edges selectively engageable with a flat work table upon which the sheet to be scored is supported, a rod slidably mounted in an axially extending opening, said cam plate, having a cross sectonal shape which is that of a regular polygon, said polygon shaped cam plate being similar to said rod cross section in that both have the same number of side edges, said rod adapted to be received in alternative orientations in said cam plate opening, and a scoring tool affixed to one end of said rod and projecting radially outwardly therefrom to engage the surface of the sheet to be scored.

4,030,196

HAIR CUTTER

Seki Koiwa, No. 2-4-13, Nakamura, Nerima, Tokyo, and Hajime Hasegawa, No. 3-21-13, Miyasaka, Setagaya, Tokyo, both of Japan

Filed Jan. 27, 1976, Ser. No. 652,791
Claims priority, application Japan, Jan. 29, 1975, 50-11373
Int. Cl.² B26B *19/20*, *19/44*
U.S. Cl. 30—133 **3 Claims**



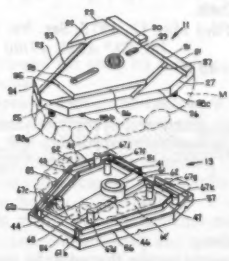
1. A hair cutting device which comprises a casing open at one side for suction of the hair ends and communicating at another location spaced from said open side with a delivery passage connectible to suction means, a guide comb extending transversely to the sides of said casing which border said open side, a fixed cutting blade secured to the side of said comb which is opposite said open side, an L-shaped member having one leg secured against the side of said blade opposite said comb and another leg is slidable engagement with one of said casing sides, and means for selectively clamping said another leg against said one casing side.

4,030,197

BASE PLATES FOR DENTAL ARTICULATORS

Donald W. Linck, II, Pleasant Hill, and George Kaprelian, Sunnyvale, both of Calif., assignors to Donald W. Linck, II, Pleasant Hill; George Kaprelian, Sunnyvale; Tom Basta, Cupertino; Maury Corbett, San Jose; William Danzig, Walnut Creek; Gary Hunt, San Mateo; Arthur Ingram, Fremont; Charles McNeill, Walnut Creek; Gerald Preiner, Burlingame and Ronald Roth, San Mateo, all of, Calif.

Filed May 14, 1976, Ser. No. 686,541
Int. Cl.² A61C *11/00*
U.S. Cl. 32—32 **10 Claims**



1. A breakway base plate for mounting dental models in articulators comprising,

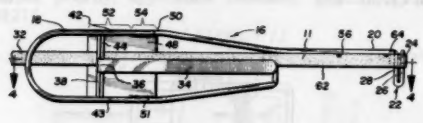
a base plate of a first size having an outer periphery, a central region having means for mounting said central region to an articulator, and a groove in said base plate between said central region and said outer periphery, said groove forming a closed curve defining a base plate of a second size, smaller than said first size, and having a groove profile for promoting material fracture along said groove, upon mechanical stressing, in preference to material fracture in base plate regions other than where said groove is disposed.

4,030,198

TOOTH ENAMEL-STRIPPING APPARATUS

Warren E. Gerber, LaJolla, Calif., assignor to Evalyn Gerber, LaJolla, Calif.

Filed Sept. 30, 1974, Ser. No. 510,320
Int. Cl.² A61C 3/06
U.S. Cl. 32—58 2 Claims



1. an orthodontic apparatus, for use with an abrasive band having a first end and a second end, to strip enamel from a tooth have a crown, said apparatus comprising:

a frame including a guiding portion;

means on said guiding portion for releasably securing said first end of said abrasive band;

lever means including a base portion;

biasing means on said frame spaced from said guiding portion for engagement with said lever means; and,

means mounting said lever means adjacent said biasing means for movement of said lever means between:

a. a first position wherein said base portion is not in contact with said biasing means to permit said second band end to be inserted between said base portion and said biasing means;

b. a second position wherein said base portion is in contact with said second band end and said biasing means for tensioning said abrasive band; and,

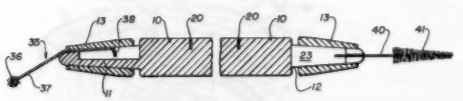
c. a third position wherein said base portion is in contact with said second band end and said biasing means for locking said abrasive band.

4,030,199

HANDLE FOR DISPOSABLE APPLIANCE

John R. Russell, San Diego, Calif., assignor to E-Z Floss, Palm Springs, Calif.

Filed May 12, 1975, Ser. No. 576,621
Int. Cl.² A61C 17/00
U.S. Cl. 32—40 R 5 Claims



1. A device for holding a removable, stem-mounted appliance comprising:

a. an elongated handle shaped to be grasped by the fingers,

b. a holding means protruding from an end of said handle, said holding means including at least one groove adapted to embrace said stem and to hold it against axial movement, and a slot between said groove and said handle, said slot opening into said groove and being slightly larger in width than in the diameter of said stem and being adapted to receive the bent end of said stem, and

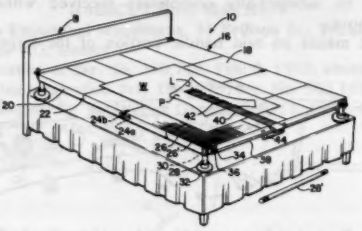
c. a removable sleeve having internal contours to form a friction fit with said holding element to surround said holding element, and, when in place on said holding element, cooperating with said holding element to form a channel including said groove, and an open end through said appliance may protrude.

4,030,200

PORTABLE SEWING ALIGNING TABLE SYSTEM

Jane S. Francis, 3900 Allendale Court, Monkton, Md. 21111

Filed Nov. 21, 1975, Ser. No. 634,267
Int. Cl.² B43L 5/00
U.S. Cl. 33—76 R 1 Claim



1. A system for use in laying out, sewing and storing cloth and the like, comprising: a table having a top, said table top having first and second ends and downward frame structure thereon, hinge means adjacent said frame structure for folding the table into storage-case configuration, the table top having a grid marking over the upper surface thereof with a plurality of holes through the table top in regular pattern at respective intersections of the grid marking, a straightedge, means including a rod for securing the straightedge detachably and slidably and pivotally at either end of the table in alignment with the grid markings such that the straight-edge can slide along said rod and the table top and can pivot about said rod to a position where the straight edge is not on said table top, means for holding the rod at each end of the table comprising a respective pair of flat-spring U-shaped clips fixed in spaced relation on said first and second ends with one leg of the U attached to said ends and the other leg of the U having a respective hole sized to fit said rod, the respective spring clips of each pair oppositely self-biasing flat at the table for storage and resiliently cramping the rod when the rod is inserted in said holes for holding, said means for securing including a shepherd's crook hook on the straight edge for quick engagement and disengagement with the rod, said straightedge having a plurality of transverse markings located for coincidence with the grid and holes through the table top when the rod is holding the straightedge.

4,030,201

METHOD AND RELEVANT APPARATUS FOR DETECTING THE GEOMETRICAL FEATURES OF MECHANICAL WORKPIECES, IN PARTICULAR FOR MEASURING THE ECCENTRICITY AND OUT-OF-ROUNDNESS

Mario Possati, and Franco Danielli, both of Bologna, Italy, assignors to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

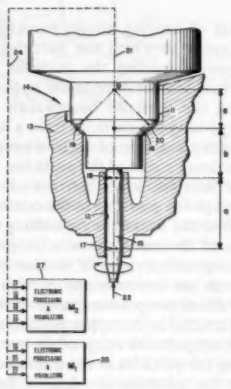
Continuation of Ser. No. 462,426, April 19, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,739
Claims priority, application Italy, Apr. 19, 1973, 3383/73
Int. Cl.² G01B 5/25, 7/31
U.S. Cl. 33—174 Q 9 Claims

1. A method for determining the cross-section out-of-roundness of a revolution surface of a workpiece and the eccentricity of the revolution surface relatively to a right circular cylindrical surface of the workpiece by using a measuring means adapted to carry out measurements of linear dimensions and to provide electric signals depending on said dimensions, comprising:

defining a measurement reference axis, substantially parallel to the axis of the cylindrical surface; defining a measurement reference point on said reference axis;

carrying out first and second measurements of linear dimensions on a first point of a first cross-section and, respec-

tively, a second point of a second cross-section of the right circular cylindrical surface, the first and second cross-sections being perpendicular to the reference axis and located at a known distance from each other, said step of carrying out first and second measurements including obtaining first and second electric signals depending on linear dimensions in directions perpendicular to said measurement reference axis, said directions coinciding substantially with diametral directions of said cross-sections, and third and fourth measurements of linear dimensions on opposed points of a cross-section of the revolution surface, this cross-section being perpendicular to said reference axis and located at known distances from said cross-sections of the right circular cylindrical surface, said third and fourth measurements including obtaining third and fourth electric signals responsive to the distance of said opposed points from said measurement reference point, said first and second points being coplanar with said opposed points;



repeating said first, second, third and fourth measurements along the whole perimeters of said cross-sections; processing said third and fourth signals to supply an indication of said out-of-roundness, said processing step including continuously electrically combining the third and fourth signals to obtain a combined signal responsive to the diameter of said cross-section of the revolution surface and evaluating the difference between the maximum and minimum values of said combined signals; and

processing said first, second, third and fourth signals to supply an indication of said eccentricity, this processing step including continuously obtaining a linear combination signal of said first, second, third and fourth signals and evaluating the difference between the maximum and minimum values of said combination signal to express the eccentricity as the distance between the center of one of said cross-sections of the revolution surface and cylindrical surface and a reference line defined by the other two cross-sections.

4,030,202

BORE GAGE

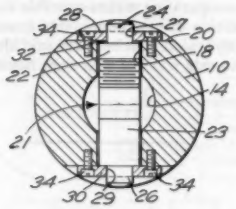
Mohamed F. A. Fadl, West Warwick, and Joseph S. Olasz, North Kingstown, both of R.I., assignors to Federal Products Corporation, Providence, R.I.

Continuation-in-part of Ser. No. 486,608, July 8, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,271

Int. Cl.[2] G01B 7/12

U.S. Cl. 33—178 E **2 Claims**

1. A bore gage comprising an elongated cylindrical housing, a substantially cylindrical electrical transducer within said housing having a pair of opposed measuring probes, each having a circular cross section, said transducer having a body of a diameter greater than the diameter of the measuring probes, said measuring probes extending in axial alignment outwardly of said housing on a diameter thereof, said housing including chordal surfaces, each chordal surface having an opening, bearing plate members on said chordal surfaces of



the housing, said probes extending through the bearing members, said bearing members locating the probes on a diameter of the housing and dimensioned to serve as an abutment for the end walls of the transducer body, the maximum length of the body being less than the distance between the plate members whereby the transducer is free to move restrained only by said bearing members, said body being sealed to prevent entry of foreign material.

4,030,203

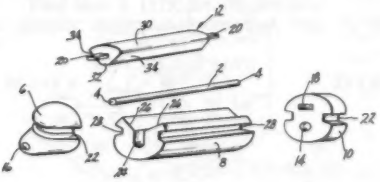
REFLEX SIGHT RETICLE ILLUMINATOR

William R. Ackerman, Jr., El Paso, Tex., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 4, 1974, Ser. No. 512,832

Int. Cl.[2] F41G 1/32; F21K 2/00

U.S. Cl. 33—241 **3 Claims**



1. A reticle illuminator for use with a sighting device, said illuminator comprising:

a. a housing comprising forward and rearward end caps and a middle portion intermediate said end caps, said end caps including first cylindrical recesses with the cylindrical recess in said forward end cap opening into a through bore which forms a reticle for the sighting device, said middle portion having a substantially U-shaped cross section with an internal trough and upwardly extending side walls terminating in upwardly and outwardly extending surfaces, said end caps and said middle portion having aligned external grooves extending to form a continuous groove around an external side surface of said housing;

b. a fluorescent rod mounted in said housing, said rod having its opposite end portions contained in said cylindrical recesses in said end caps; and

c. a transparent cover member secured to said end caps and overlying said rod, said cover member having upwardly and outwardly extending side walls overlying said upwardly and outwardly extending surfaces on said side walls of said middle portion.

3. A sighting device comprising a sight housing having an opening formed in a side wall thereof, a reticle illuminator housing mounted in said opening, said illuminator housing

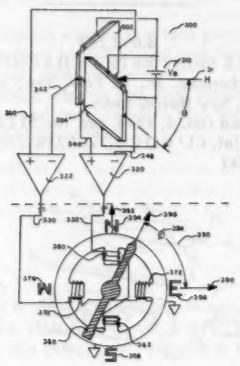
having an external groove formed in a side wall thereof, side walls of said sight housing opening being disposed in said groove to retain said illuminator housing in place on said sight housing, said illuminator housing includes end caps, a middle portion, and a top cover, said end caps being provided with recesses and said top cover being provided with projections disposed in said recesses and thereby secured to said end caps, said top cover, said end caps and said middle portion being provided with cooperating means operable to bias side walls of said middle portion of said illuminator housing outwardly to produce a tightly sealed joint between said illuminator housing groove and said side walls of said sight housing opening.

4,030,204

REMOTE INDICATING SOLID STATE MAGNETIC SENSOR

Robert A. Edwards, 12 Notch Park Road, Little Falls, N.J. 07424

Filed Mar. 18, 1974, Ser. No. 452,430
Int. Cl.² G01C *17/30*
U.S. Cl. 33—361 **1 Claim**



1. A low-inertia remote-indicating magnetic compass utilizing a solid-state magnetic sensor and providing a continuous 360° read-out meter movement for use in automobiles or the like and comprising:

a magnetic sensor consisting of a pair of Hall generators mounted to a vehicle in vertical planes, at right angles to one another, with one of two corresponding pairs of each generator's parallel edges connected across a source of d-c voltage, and with the remaining two parallel pairs of edges connected to the inputs of linear amplifiers to amplify Hall voltages, proportional to sine and cosine components of the earth's magnetic field, and with adjustable compensation magnets in the vicinity of said generators to cancel spurious magnetic fields of said automobile.

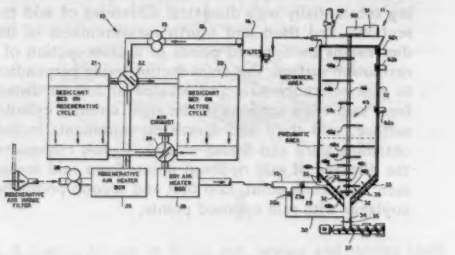
an indicator consisting of a stator with quadrature windings connected to outputs of said linear amplifiers, a magnetized rotor-pointer which pivots about the stator's principal axis in response to currents in stator windings, and a circular compass scale, centered with respect to the rotor's pivot axis. Rotor position ranging through 360° and determined by relative magnitudes of quadrature winding currents, pointer-position relative to map scale indicative of vehicle heading.

4,030,205

DRYING SYSTEM FOR PARTICLES

Joseph D. Robertson, 980 Swathmore Drive, NW., Atlanta, Ga. 30327, and Dean L. Ward, 414 James St., Lilburn, Ga. 30247

Filed Dec. 29, 1975, Ser. No. 644,902
Int. Cl.² F26B *7/00*
U.S. Cl. 34—12 **10 Claims**



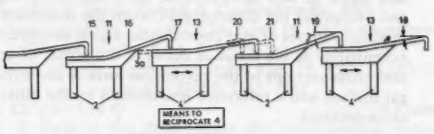
1. A process of treating plastic particles having a critical temperature range in which the particles tend to cling together, comprising feeding the particles at a temperature below the critical temperature to the upper portion of a container, moving the particles downwardly through the container and dispensing the particles from a lower portion of the container, heating a stream of air to a temperature above the critical temperature range of the particles, moving the stream of heated air into the lower portion of the container and upwardly through the particles in the container and out of the upper portion of the container for heating the particles in the lower portion of the container to a temperature level above the critical temperature range of the particles and for heating the particles in an intermediate portion of the container through the critical temperature range of the particles and for heating the particles in the upper portion of the container up to the critical temperature range of the particles, and continuously agitating the particles in the intermediate portion of the container as the particles are heated from a temperature below the critical temperature range of the particles until the particles have been heated to a temperature above the critical temperature range of the particles.

4,030,206

THRUST GRATE SUCH AS A HEAT EXCHANGE GRATE

Herbert Bode, Wohltorf, Germany, assignor to Claudius Peters AG, Hamburg, Germany

Filed June 2, 1975, Ser. No. 582,695
Claims priority, application Germany, June 7, 1974, 2427684
Int. Cl.² F26B *9/00*
U.S. Cl. 34—164 **10 Claims**



1. A thrust grate, particularly a cooling or a fire grate, comprising, a horizontally disposed sequence of overlapping grate plates which are alternatingly fixed and movable forward and backward, each said plates having a rear portion extending parallel to the direction of movement of the said movable grate plates, an at least partially upward slanting front portion on each of said grate plates terminating in a downwardly inclined front end thrust nose, means to move the said movable grate plates essentially in a horizontal direction. The angle of the front portion of the said fixed grate plate being

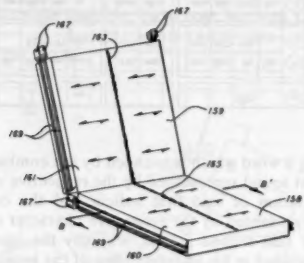
greater than the angle of slope of the front portion of the said movable grate plate whereby the displacement of materials on the said thrust grate will be smaller on the backward movement of said movable grate plate than at the forward movement thereof.

4,030,207

G-SEAT WITH SKIN TENSION CUE GENERATOR

Gerald J. Kron, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,895
Int. Cl.² G09B 9/08
U.S. Cl. 35—12 E **29 Claims**



1. A method of simulating the motion of a vehicle, comprising:

locating a subject on a body-supporting surface of a seat cushion, said seat cushion having a driveable component;

driving said seat cushion component to produce skin tension variations in a selected portion of the subject's skin proximate said surface, similar to the variations experienced in said skin portion during actual operation of the vehicle being simulated, said component being driven according to a predetermined schedule correlating component movement with compatible skin tension variations in said selected skin portion and developing said predetermined schedule from simulated motion profiles to directly generate the compatible skin tension variations.

29. Apparatus for simulating vehicular motion comprising:

a dynamic for providing simultaneously, independently variable haptic sensory system cues, said cues including the skeletal attitude, extent of seat contact, flesh pressure gradient and flesh surface tension of an occupant; and

means for controlling the operation of said seat so that it provides compatible haptic sensory system cues to said occupant.

4,030,208

SEAT VIBRATION SYSTEM FOR SIMULATING AIRCRAFT BUFFETING

Fred F. Carver, R.D. 1, Box A317, Chenango Forks, N.Y. 13746, and Carl E. Hoyt, 8081 Hillandale Drive, San Diego, Calif. 92120, assignors to The Singer Company, Binghamton, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,447
Int. Cl.² G09B 9/08
U.S. Cl. 35—12 F **8 Claims**

1. Apparatus for simulating, in the cockpit of a flight trainer, the buffeting experienced in an operational aircraft, comprising:

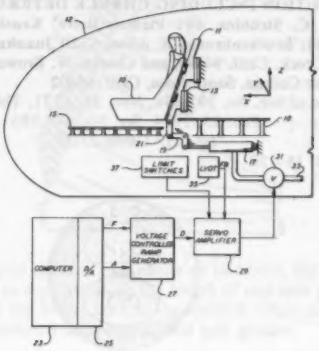
an ejection rail located within the cockpit of said flight trainer;

a seat mounted on said ejection rail;

means fixed relative to said cockpit for supporting said ejection rail from the rear;

at least one linear bearing oriented along the trainer's z-axis and connecting said ejection rail to said rear supporting means;

means for jointly vibrating said seat and ejection rail relative to said cockpit along said linear bearing, said vibrating means comprising an hydraulic actuator having a bi-directionally movable ram and means linking said ram to the bottom end of said ejection rail so that ram movement is translated into z-axis seat movement, said vibrating means being located within said cockpit, said hydraulic actuator being disposed perpendicular to said z-axis, and



said linking means comprising a rotatable bell crank and a link; and

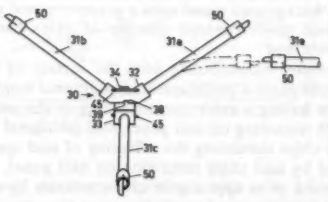
means for controlling the frequency and amplitude of said vibration in such a way as to provide an occupant of said seat with vibration sensations similar to those experienced in the operational aircraft during buffeting.

4,030,209

MOLECULAR MODELS

André Dreiding, Langackerstrasse 43, Herrliberg, Switzerland

Filed Mar. 3, 1975, Ser. No. 555,044
Claims priority, application Switzerland, Mar. 7, 1974, 3201/74
Int. Cl.² G09B 23/26
U.S. Cl. 35—18 A **29 Claims**



1. A structural element for forming stereochemical models of molecular bonds between mutivalent atoms, said structural element comprising:

at least two connector arms representing the valences of at least one atom, at least two of said connector arms having each a free end portion provided with manually operable means for pairwise coaxial coupling and uncoupling of the arm to or from another connector arm of the same or of another said element;

articulation means for pivotally connecting together at least two of the connector arms in such a manner as to permit variation of the angular relationship of at least one of the connector arms with respect to at least one other of the arms; biasing means associated with the articulation means for producing a discontinuous manually surmountable resistance against pivotal movement and therewith for providing at least two discrete and stable rest positions with predetermined angular relationships between the connector arms, depending on the natural behavior of the

matter represented by structural element, thus avoiding unintended yet permitting intended movement from any selected rest position.

4,030,210

METHOD OF AND MEANS FOR DEMONSTRATING EVOLUTION INCLUDING CHANCE DETERMINATIONS

Robert C. Stebbins, 601 Plateau Drive, Kensington, Calif. 94708; Brockenbrough S. Allen, 1320 Juanita Drive, Walnut Creek, Calif. 94595, and Charles W. Brown, Santa Rosa Junior College, Santa Rosa, Calif. 95402

Division of Ser. No. 202,496, Nov. 26, 1971. This application Feb. 25, 1974, Ser. No. 445,593

Int. Cl.² G09B *23/36*

U.S. Cl. 35—20 **5 Claims**

1. A method of demonstrating the results of the organic evolutionary process known as natural selection comprising the following steps:

a. providing a background panel of predetermined color and design for simulating a life-sustaining environment;

b. providing a plurality of chips of different colors, each of said colors simulating a different species of life existing in said environment;

c. selecting a predetermined number of chips from said plurality thereof;

d. distributing said predetermined number of said chips onto the surface of said background panel so that, because of their color, some of said chips blend more readily into said background panel than other ones of said chips;

e. removing individual chips as they are readily detected by visual recognition due to their failure to readily blend into said background panel until a predetermined percentage of said predetermined number of chips has been removed; and

f. thereafter redistributing onto the surface of said background panel a predetermined additional number of said chips having a color corresponding to the color of said chips remaining on said panel; said additional number of said chips simulating the offspring of said species simulated by said chips remaining on said panel, and being selected as to appearance characteristics by chance determinations.

4,030,211

INSTRUCTIONAL SYSTEM FOR TEACHING AND TESTING WORD PRONUNCIATION AND SPELLING

Edward J. McGinley, 76 Old Hollow Road, Short Hills, N.J. 07078

Filed Feb. 10, 1976, Ser. No. 656,853

Int. Cl.² G09B *17/00*

U.S. Cl. 35—35 H **16 Claims**

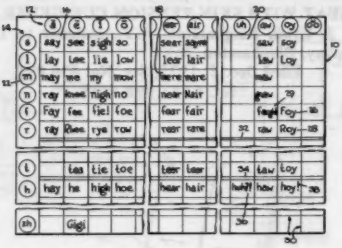
1. An instructional chart for teaching word pronunciation comprising:

a. a carrier;

b. first indicia disposed upon said carrier, said indicia including the character representation for a plurality of pronunciation symbols for vowels; a character representation heading an imaginary column or row emanating therefrom;

c. second indicia disposed upon said carrier, said indicia including the character representation of a plurality of pronunciation symbols for consonants; a character representation heading an imaginary row or column emanating therefrom; and

d. third indicia disposed upon said carrier at the juncture of at least one imaginary column and row; said third indicia comprising the letter representation of at least one entry



including a word which is sounded by the combination of the vowel sound represented by the respective character representation of said first indicia and the consonant sound represented by the respective character representation of said second indicia, whereby the user of said chart is guided in his understanding of the pronunciation of said entry.

4,030,212

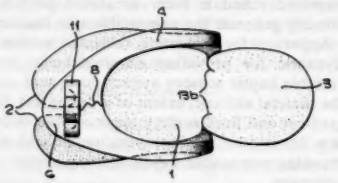
ONE-PIECE SANDAL MADE FROM A FLAT SHEET

Kakutaro Ito, Kobe, Japan, assignor to Kakutaro Ito and Yuzoh Katoh, both of Kobe, Japan

Filed Aug. 26, 1976, Ser. No. 717,571

Int. Cl.² A43B *3/12;* **A43D** *9/00*

U.S. Cl. 36—11.5 **14 Claims**



1. A one-piece sandal made from a flat sheet of relatively soft, resilient material, characterized in that:

said sheet forms a sole member of such size and shape as to extend underneath both the heel and toes of a wearer's foot, said sheet also having two further extending portions which are partially cut away from said sole member such that one end of each said portion remains integral with said sole member while the other end thereof is movable relative to said sole member;

said two further extending sheet portions being adapted to form strap means extending above said sole member just rearwardly of the toe portion thereof;

said movable ends of said two sheet portions also being of such configuration as to cooperatively form latch means for releasably securing the same together.

13. The method of manufacturing a sandal from a single flat sheet of relatively soft, resilient material, comprising the steps of:

cutting the sheet to about the configuration of the under side of the wearer's foot, but with some longitudinally forward and longitudinally rearward extension thereof;

cutting the forward extension partially away from the remainder of the sheet so that it has an enlarged forward

extremity which can be bent upwardly relative to the sheet; and

cutting the sheet along the lateral sides and around the rearward edge of the heel portion thereof to provide a loop of material, and also cutting a notch in the lateral center of said loop;

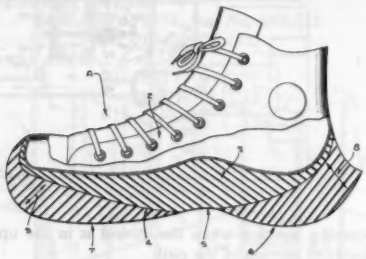
so that said stem and said loop may then be bent towards each other and releasably latched together for forming a strap means for the sandal.

4,030,213

SPORTING SHOE

Alexander C. Daswick, 647 Orange Grove, South Pasadena, Calif. 91030

Filed Sept. 30, 1976, Ser. No. 728,211
Int. Cl.² A43B *13/12, 5/00*
U.S. Cl. 36—30 R **3 Claims**



1. A sporting shoe comprising:

an upper housing;

a relatively rigid sole disposed beneath and secured to said housing, the bottom surface of said sole being convexly arcuately curved in a longitudinal direction so that its longitudinal center portion provides a pedestal, whereby when a runner wearing the shoe lands upon a running surface with the heel portion of said sole the runner's foot and the shoe will then roll forward in a pivotal movement about said pedestal;

a first resilient auxiliary sole member secured to the heel portion of said rigid sole; and

a second resilient auxiliary sole member secured to the toe portion of said rigid sole.

4,030,214

ADJUSTABLE FLEXURE MEANS FOR SKI BOOT

Alden B. Hanson; Chris A. Hanson, and Donald W. Bertetto, all of Boulder, Colo., assignors to Hanson Industries Inc., Boulder, Colo.

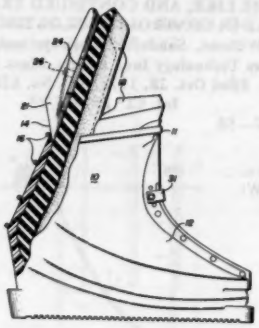
Filed Mar. 21, 1975, Ser. No. 560,994
Int. Cl.² A43B *21/00, 5/04*
U.S. Cl. 36—105 **6 Claims**

1. A ski boot with means for adjusting the flex in the boot, said boot comprising a semi-rigid shell having a closure system for closing said shell about the foot of a wearer, said shell having a split portion commencing at the top of said boot and extending toward the bottom thereof, said split portion being defined in part by a pair of opposed generally parallel edges;

said shell being provided with a plurality of opposed apertures adjacent the edges of said split; and

clip means for interconnecting the edges of said split portion at a desired point along the length thereof corresponding to the location of an opposed pair of said apertures;

said clip means comprising a base member and spaced generally parallel leg members extending outwardly from said base member, each leg member being adapted to be received in one of said apertures, said clip being positioned with said base member within said shell and said leg members projecting outwardly through said apertures;



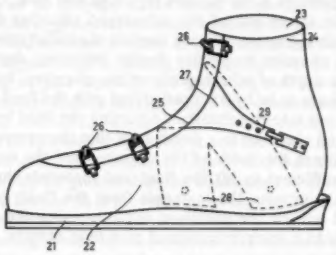
whereby upon exertion of pressure on said boot, the shell is adapted to separate along the length of said split portion from the top of the boot to the location where said clip means connects the edges of said split portion.

4,030,215

SPORTS SHOES MADE OF PLASTIC

Raimund W. Vogel, Lier St. 25, Munich 19 D8, Germany

Continuation of Ser. No. 189,846, Oct. 19, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 457,632
Int. Cl.² A43B *5/04*
U.S. Cl. 36—119 **5 Claims**



1. A plastic ski boot comprising a boot sole, a boot upper connected with said sole, said upper being stiff at least in the region of said sole and its sides and laterally above the ankle bone region of said upper, characterised in that the stiff lateral sides form recesses above the heel at the rearmost part of said upper and the instep region, and in that said upper includes a closing border of elastically deformable material having at least two appendages one of which extends from and closes said recess above the heel bone region of said upper and the second of which extends and closes said recess above the instep region of said upper, said closing border and its appendages being more elastically deformable than the remaining portion of said upper and decreasing in elasticity from the uppermost portion of said closing border in the direction of said sole of said boot, whereby said elastically deformable closing border is fixedly connected at the edge of said stiff upper, whereby every change of position between the foot and the lower leg of the skier required in skiing is possible without said elastically deformable closing border of said upper of said boot losing its snow-tight fit in respect to the leg of the skier positioned in said boot.

4,030,216

METHOD OF AND APPARATUS FOR UNDERWATER HYDRAULIC CONVEYING, AS FOR OCEAN MINING AND THE LIKE, AND CONTINUED TRANSPORT OF MATERIAL IN CONTROLLED FLOATING CONTAINERS

Jan-Olaf Willums, Sandvika, Norway, assignor to Nor-Am Resources Technology Inc., Boston, Mass.

Filed Oct. 28, 1975, Ser. No. 626,492
Int. Cl.² E02F 3/88
U.S. Cl. 37—58 17 Claims

1. A method of hydraulically lifting and conveying materials carried by fluids from underwater depths, that comprises, suspending a partially gas-filled pumping chamber by cable means from a stable surface platform and submerging said chamber in said fluid spaced from the bottom thereof; maintaining the pumping chamber at a pressure equal to the atmospheric pressure at the surface region of said fluid; communicating the lower end of the submerged chamber through a fluid-receiving-and-conveying conduit of smaller cross-section than the chamber to greater depths, including depths many times the depth of submergence of the chamber, from which materials are to be hydraulically lifted with the fluid along the conduit and into the chamber; adjusting the fluid level of the submerged chamber to a depth such that the pressure difference between the inside of the chamber and the surrounding fluid is sufficient to lift the fluid and materials through the conduit; separating the materials from the fluid; exhausting the fluid outside the chamber; and conveying the separated materials to a surface region of said fluid remote from said platform.

4,030,217

TWO WHEEL EXCAVATING AND LOADING SYSTEM

Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Continuation of Ser. No. 596,677, July 17, 1975, Pat. No. 3,982,340, which is a continuation-in-part of Ser. No. 435,296, Jan. 21, 1974, Pat. No. 3,896,571. This application Sept. 2, 1976, Ser. No. 720,061
Int. Cl.² E02F 3/24
U.S. Cl. 37—190 6 Claims

1. An excavating and loading system comprising: an excavating wheel assembly comprising axle means and at least two rigid excavating wheels rotatably mounted cantilever on and supported on the axle means, said excavating wheel assembly having a width at least equal to the widest portion of the remainder of the system;

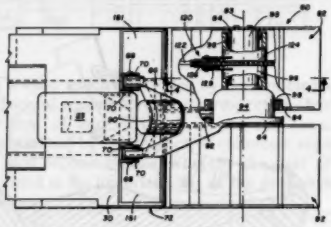
each of said excavating wheels including a plurality of digging buckets located immediately adjacent one another to define the entire circumference of the excavating wheel, each bucket having a cutting edge which extends to a stationary wall, and a wall mounted for pivotal movement from a material receiving position to a material dumping position;

supporting and housing means extending between the excavating wheels and connected to the axle means for supporting the excavating wheel assembly;

each of said digging buckets extending continuously between a side wall thereof located immediately adjacent to the supporting means and a side wall thereof defining one end of the excavating wheel assembly;

drive means including at least one motor means and speed reducer means drivingly connecting the motor means to the excavating wheel assembly for rotating the excavating wheels so that the digging buckets follow a circular path;

means located within the margins of the excavating wheel assembly and responsive to rotation of the excavating wheels for positively positioning the movable wall of each digging bucket of the excavating wheels in the material



dumping position when the bucket is in the upper and rearward portion of the path;

a vehicle for supporting and manipulating the excavating wheel supporting means and thereby positioning the excavating wheel assembly in engagement with material to be excavated;

an engine mounted on the vehicle;

means mounted on the vehicle and driven by the engine for supplying operating power to the motor means; and

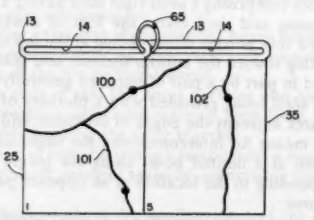
conveyor means mounted on the vehicle entirely behind the excavating wheel assembly for movement around a course including a relatively low portion positioned to receive material from the digging buckets of the excavating wheels upon the positioning of the movable walls of the buckets in the material dumping position and a relatively high material delivery portion located rearwardly on the vehicle for the low portion.

4,030,218

SEGMENTED MAP AND HOLDER

Guy N. Stockwell, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 7, 1976, Ser. No. 720,713
Int. Cl.² G09B 29/02
U.S. Cl. 40—102 9 Claims



1. A segmented map comprising:

a plurality of map segments derived from a map divided into

rows and columns, the map segments together constituting the thus divided map,

plural sheets each comprising on the face thereof one said map segment and on the back thereof a second said map segment which is adjacent to the first map segment in said map,

a flap extending along the edge of each said sheet said flap being longer than the said edge of the sheet, and having a slot therein said slot of each said flap being longer than the said edge of the sheet, and

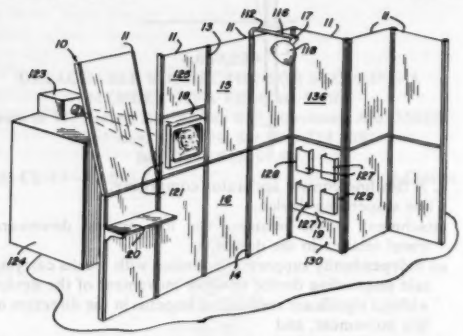
holding means extending through said slots to hold said sheets in assembled relationship,

whereby a back and front of two sheets, and the backs and fronts of two sheets may be placed adjacent to each other for viewing two map segments simultaneously.

4,030,219
PORTABLE DISPLAY APPARATUS

John E. Donovan, Skokie, Ill., assignor to Package Exhibit Programs, Inc., Niles, Ill.

Filed June 1, 1976, Ser. No. 688,821
Int. Cl.² G09F 13/00
U.S. Cl. 40—130 R **1 Claim**

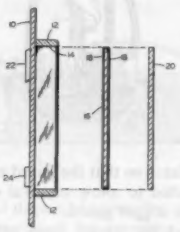


1. A display apparatus for use in exhibitions and shows, comprising; a plurality of releasably connected display frames, each display frame of said plurality having an upper rectangular portion and a lower rectangular portion hingedly connected to the upper rectangular portions, each of said upper rectangular portions and said lower rectangular portions including a pair of parallel uprights connected to each other, each of said uprights being an extruded anodized aluminum section having a support portion, a connector portion formed integral with said support portion, and a track portion formed integral with said support portion and said connector portion, each support portion being adapted to receive a fastener extending through the support portion substantially parallel to the track portion for connecting adjacent uprights in a substantially parallel attitude, each support portion and connector portion being adapted for receiving a fastener extending through the support portion and the connector portion substantially perpendicular to the track portion and being spaced away from the track portion for connecting adjacent uprights in a substantially perpendicular attitude, a display panel slideably mounted in each of the frames between parallel uprights in the respective track portions of said uprights, a panel stop positioned between the display panels mounted on each frame to prevent an upper display panel from sliding into contact with a lower display panel; a literature pouch slideably connected to said track portions of said uprights, said literature pouch including a plurality of pockets adapted to hold literature to be distributed, a shelf adapted to be connected to a pair of side connectors of one of said frames; and a projection screen connected to one of said display frames at a height slightly above the height of a carrying container for said portable display apparatus, said projection screen being a rear projection screen and being adapted to display projected films.

4,030,220
FRAME FOR TEXTILES, NEEDLEWORK AND THE LIKE

Deborah L. Kotchen, 108 Gilbert Ave., Rocky Hill, Conn. 06067

Filed Dec. 29, 1975, Ser. No. 644,434
Int. Cl.² G09F 1/12
U.S. Cl. 40—156 **5 Claims**



1. A frame for material to be mounted such as needlepoint and the like comprising:

a. a substantially planar base member of rigid sheet material;

b. a continuous sidewall extending forwardly from and generally perpendicularly to one surface of said base member, said sidewall having inner surfaces circumscribing at least a portion of said base member surface and defining a frame enclosure, said sidewall and the portion of said base member circumscribed thereby defining a seating recess; said side wall is spaced inwardly from the peripheral edge of said base member;

c. a mounting member of relatively rigid generally planar sheet material having a peripheral edge and an inwardly facing surface, said member having substantially the same peripheral configuration as the inner surface of said sidewall and seated therewithin, said mounting member being adapted to provide a functional mounting for flexible material of greater dimension whereby the material to be mounted includes portions to be folded about the peripheral edge of said mounting member against the inwardly facing surface thereof, said mounting member having a dimension slightly smaller than the dimensions of said recess and sufficiently large so that the combined dimensions of said mounting member and the material portions folded about the peripheral edge of said mounting member is slightly greater than the dimensions of the recess so that a friction fit is provided upon seating of said mounting member within said recess; and

d. mounting means on the other surface of said base member for mounting said frame upon a wall or the like.

4,030,221
GUN LOCK USING MANUAL PRESSURE

William Doobenen, 6472 Camino Viviente, Goleta, Calif. 93017, and Robert Thomas Hennessy, 932 N. Patterson, Santa Barbara, Calif. 93111

Filed Oct. 6, 1976, Ser. No. 730,125
Int. Cl.² F41C 27/10
U.S. Cl. 42—1 Y **7 Claims**

1. A gun lock for guns having a trigger guard in a plane and having a trigger disposed within the trigger guard, comprising:

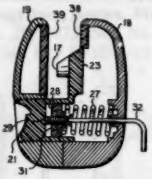
a. a housing of U-shaped cross section having a spacing between the legs of the U-shape to fit over the trigger guard and having sidewalls extending parallel to the plane of the guard to cover the trigger;

b. a latch disposed in the housing for movement in a direction transverse to the plane of the trigger guard and having a part projecting into the U- shape of the housing upon movement of the latch toward the opening of the U-shape;

c. a spring in said housing engaging the latch and urging said

latch in a direction to cause said part normally to engage the trigger guard;

d. and a manual pressure member at one sidewall of the housing to be manually squeezed to overcome the spring



to move the latch so that the guard engaging part is sufficiently retracted to allow removal of the entire trigger lock from the trigger guard,

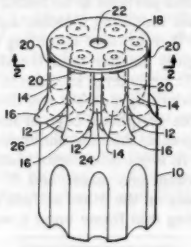
to thereby protect the trigger from persons of insufficient strength to retract the latch from the trigger guard.

4,030,222

CARTRIDGE LOADING DEVICE FOR REVOLVERS

Carl G. Sommer, 81-27 250th St., Bellerose, N.Y. 11426

Filed May 24, 1976, Ser. No. 689,362
Int. Cl.² F42B *39/04*
U.S. Cl. 42—89 **7 Claims**



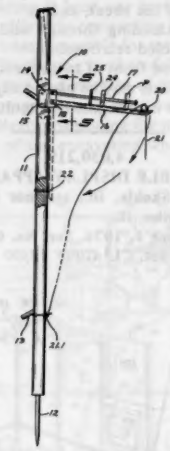
1. A cartridge loading device for revolvers comprising a plate, a plurality of cartridge grasping cams, hinging means for independently hingeably affixing each of said plurality of said cartridge grasping cams to said plate, a portion of said each of said plurality of said cartridge grasping cams broken away permitting a cartridge to be removed from said cartridge grasping cam grasping said cartridge and for insertion into a chamber in the cartridge loading surface of a cylinder of a revolver, said plurality of said cartridge grasping cams disposed circularly about said plate, said plurality of said cartridge grasping cams each having a cylinder contacting surface, said cylinder contacting surface for disposing said each of said plurality of said cartridge grasping cams radially outwardly from said cartridge loading surface upon said plate being manually urged towards said cartridge loading surface, said cylinder contacting surface for engagement with the marginal edges of said cartridge loading surface, said cylinder contacting surface forming an acute angle with the longitudinal axis of said cartridge when said cartridge is grasped within said cartridge grasping cam.

4,030,223

FISH LINE CONTROL APPARATUS WITH MAGNETIC RELEASE

Leo J. Loesch, and Claude E. Loesch, both of Kimball, Minn. 55353

Filed May 2, 1975, Ser. No. 573,956
Int. Cl.² A01K *97/12*
U.S. Cl. 43—15 **18 Claims**



1. A fish line control apparatus comprising:

a line suspending device,

attachment means retaining the line against downward travel relative to the device,

an independently supported mounting with means carrying said suspending device to allow movement of the device without significant restraint or impetus in the direction of line movement, and

the mounting and device incorporating a two part magnetic system, one part of the system being incorporated into the mounting, and the other part of the system being incorporated into the device, the two parts of the magnetic system having magnetic attraction for each other and being arranged to releasably restrain the device from moving with the line, the magnetic system having releasing characteristics for releasing the line suspending device in response to tension on the line resulting from action of a game fish, the transmission of line tension to the attachment means and the magnetic forces of the magnetic system providing the only influence upon the suspending device controlling restraint and release of the device in response to such tension on the line, the attachment means and the magnetic system operating alternately and to the exclusion of other influences on the suspending device to effect restraint and release of the device to move unidirectionally upon release.

4,030,224

LINE GUIDE FOR A FISHING ROD

Thor Dorph, San Francisco, Calif., assignor to Bjorn Lie and Gina Lie, both of Oslo, Norway

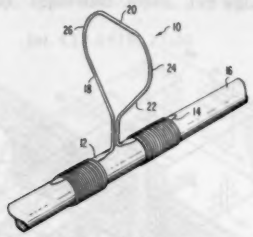
Filed May 27, 1976, Ser. No. 690,708
Int. Cl.² A01K *87/04*
U.S. Cl. 43—24 **2 Claims**

1. A line guide for a fishing rod comprising:

an annular ring;

means defining a groove in the periphery of said ring, said groove having a plurality of substantially equally spaced flat bottom portions interconnected by circular segments of equal radius and spaced circumferentially around said ring; and

resilient wire means for mounting on a fishing rod for supporting said ring in a plane perpendicular to the axis of the rod in any one of a plurality of rotatable indexable positions, said wire means extending around said ring and having at least three straight sections which engage with



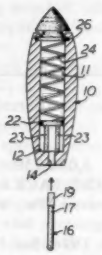
said flat bottom portions of the groove in said ring at substantially equally spaced locations around the circumference of said ring, said straight portions being interconnected by substantially circular segments lying outside the outer diameter of said ring when said ring is snapped into said wire means.

4,030,225

DETACHABLE CONNECTOR FOR SECURING A MEMBER TO A FISHING LURE

Kenneth W. Earley, Rte. 6, Box 839, Bessemer, Ala. 35020

Filed Aug. 13, 1976, Ser. No. 714,020
Int. Cl.² A01K *91/04*
U.S. Cl. 43—42.09 **7 Claims**



1. In a detachable connector for attaching one end of an elongated member to a fishing lure body comprising,

a. an inwardly extending bore in said body with the outer end of said bore terminating in a shoulder in spaced relation to an adjacent surface of said body,

b. an elongated slot in said adjacent surface of said body communicating with said bore,

c. at least one lateral projection carried by an end of said elongated member and being of a size and shape to pass through said slot into said bore while said projection is in a first position in alignment with said slot and to engage said shoulder upon rotation of said elongated member and said projection carried thereby to a second position after moving said projection into said bore,

d. a yoke-like member within said bore having a transverse member connected to spaced apart outwardly extending legs disposed to engage said shoulder at opposite sides of said slot and at opposite sides of said projection upon movement of said projection to said first position within said bore and disposed to enter said slot at opposite sides of said elongated member upon movement of said projection to said second position within said bore, and

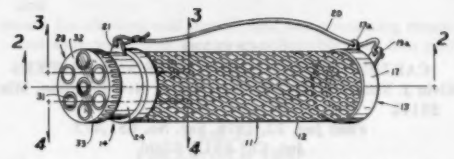
e. means to urge said yoke-like member outwardly so that said legs are moved into said slot at opposite sides of said elongated member upon movement of said projection to said second position.

4,030,226

INSECT CARRIER AND DISPENSER APPARATUS

Jack P. Shelton, Sr., 3790 William Paul Drive, Austell, Ga. 30001, and John M. Adam, 1209 Baker Lane, Marietta, Ga. 30062

Filed May 6, 1976, Ser. No. 683,822
Int. Cl.² A01K *97/04*
U.S. Cl. 43—55 **6 Claims**



1. Insect carrier and dispenser apparatus, comprising:

means defining a container for receiving and retaining a number of insects;

a plurality of individual insect receiving chambers mounted in proximity to said container, each said chamber having an entrance and a separate exit;

entrance means disposed between said carrier and the entrances of said plural chambers, said entrance means selectably permitting an insect within said container to enter a selected one of said chambers and blocking insect entry into at least one other such chamber;

exit means disposed adjacent the exits of said plural chambers to close all but one of said other chambers to the exit of an insect within each of said chambers; and

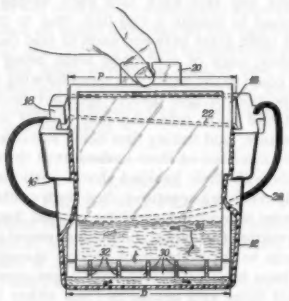
means operatively interconnecting said entrance means and said exit means to prevent entrance and concurrent exit of an insect from the same chamber.

4,030,227

BAIT BUCKET

Everett J. Oftedahl, 505 Highway 173, Antioch, Ill. 60002

Filed May 28, 1976, Ser. No. 690,919
Int. Cl.² A01K *97/04*
U.S. Cl. 43—56 **4 Claims**



1. A bait bucket, comprising: a bait receptacle having an open top; and a removable, combination lid and scoop for covering the receptacle and for scooping live bait from within the receptacle, said receptacle including four sidewalls and a ledge on said sidewalls extending substantially around the inner perimeter of the receptacle for supporting the lid when the bait bucket is closed, said ledge being so positioned with respect to the top of the receptacle that, when the lid is resting on the ledge, the top of the lid is substantially flush with the top of the receptacle, said lid having at least one end portion which projects substantially downwardly into the receptacle when the lid is covering the receptacle and which serves as a bait scoop when the lid is removed from and inserted into the

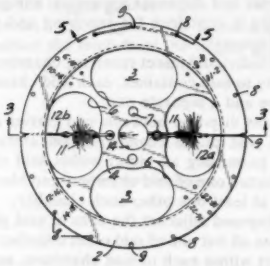
receptacle and said lid including an integral handle projecting from a second end portion of the lid and said receptacle including a slot in one of its walls for receiving said handle.

4,030,228

CARTRIDGE FOR FISHING FLIES AND LEADERS

Elvin J. Schaefers, 203 Windsor Court, New Brighton, Minn. 55112

Filed Jan. 22, 1976, Ser. No. 651,473
Int. Cl.² A01K *97/06*
U.S. Cl. 43—57.5 R **1 Claim**



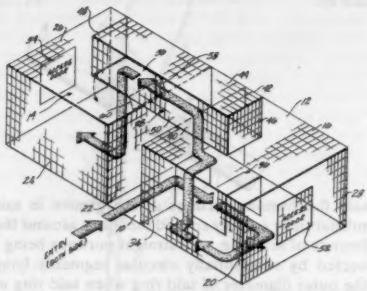
1. A cartridge for separate attachment, storage and drying of a plurality of fishing flies, having barbed ends and hackled shank portions, with leaders attached to said hackled shank portions, and for winding said leaders separately upon said cartridge; said cartridge comprising a front face, a back face, a divider member, and spool forming components; said front face and said back face being spaced approximately equidistantly from said divider member by means of said spool forming components, said front face and said back face being provided with a plurality of leader securing holes located adjacent the peripheries of said front face and said back face, said front face and said back face each having its central portion removed to render it ring-like, thus to provide centrally located open areas between each of said faces and said divider member; each of said open areas being of a depth substantially equal to the width of a spool forming component; the central portion of said divider member being provided with at least one hook receiving hole and at least one fly receiving aperture; said fishing flies being storable within said open areas by insertion of their barbed ends through a hook receiving hole with their hackled shank portions suspended within said fly receiving apertures, free from contact with any surface thereby minimizing crushing of said hackled shank portions, permitting free circulation of air around said hackled shank portions to facilitate quick drying thereof after said fishing flies have been used; said open areas providing ready access to said holes and apertures from either face or said cartridge for attachment and removal of said fishing flies, and further providing for the visual identification and selection of fishing flies stored in said cartridge; said spool forming components providing side by side tracks, said side by side tracks being separated by said divider member; means whereby the leaders attached to the hackled shank portions of each of said fishing flies stored within said cartridge may be brought into and maintained in position to be wound separately on said side by side tracks, each of said leaders being wound separately upon a separate one of said side by side tracks to prevent entanglement of said leaders; said leader securing holes providing means whereby the free ends of said leaders may be separately secured in position upon said cartridge after said leaders have been wound thereon; and means for encasing said cartridge.

4,030,229

BIRD TRAP

Morris D. Sale, 388 Sunset Way, Palm Springs, Calif. 92262

Filed June 4, 1976, Ser. No. 692,864
Int. Cl.² A01M *23/04*
U.S. Cl. 43—69 **6 Claims**



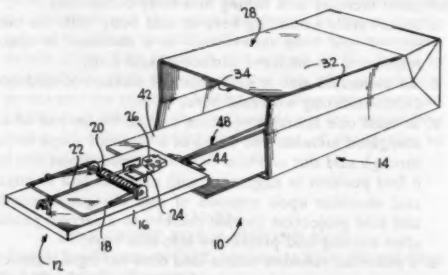
1. A bird trap comprising first and second cages made of open mesh wire screen forming two cages in closely spaced relationship, an open passage extending between the two cages, and an overhead tunnel extending across the tops of the two cages and bridging the space between them, the first cage having an opening in the side of the cage from the space between the cages into the interior of the cage and an opening through the top of the cage into the overhead tunnel, the second cage having an opening through the top of the cage into the overhead tunnel.

4,030,230

ANIMAL TRAP AND PACKAGE THEREFOR

Anthony J. Souza, Lancaster, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed Apr. 6, 1976, Ser. No. 674,098
Int. Cl.² A01M *23/30*
U.S. Cl. 43—81 **10 Claims**

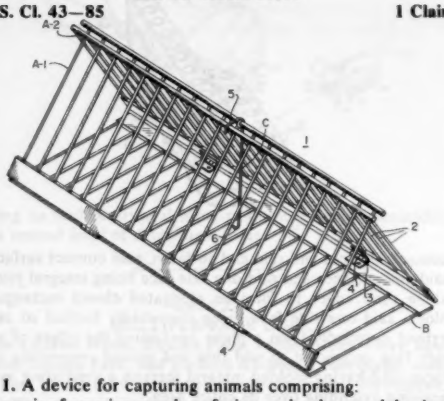


1. In combination, animal trap means and a package means therefor, said package means including a container portion, resilient means normally tending to withdraw said trap means into said container portion of said package means, and limited stop means forming part of said package means for temporarily maintaining said trap means outside said container portion of said package means, springing of said trap means in catching an animal overriding said limited stop means, whereby said trap means and the animal trapped thereby are automatically withdrawn into said container portion of said package means.

4,030,231
DEVICE FOR CAPTURING ANIMALS

Shuji Fukutome, 14-8, Kudo 2-chome, Ohji-cho, Kitakatsuragi, Nara, Japan

Filed July 8, 1976, Ser. No. 703,423
Claims priority, application Japan, July 11, 1975, 50-97667[U]
Int. Cl.² A01M 23/00
U.S. Cl. 43—85 1 Claim



1. A device for capturing animals comprising:

a pair of pressing members facing each other, each having a rectangular frame and a plurality of parallel elongated pieces therein disposed along and at right angles to the opposite longer sides of said rectangular frame,

said parallel elongated pieces of one pressing member being disposed so as to be between the parallel elongated pieces of another pressing member, whereby said pressing members are not to be separated from each other at one longer side of each thereof;

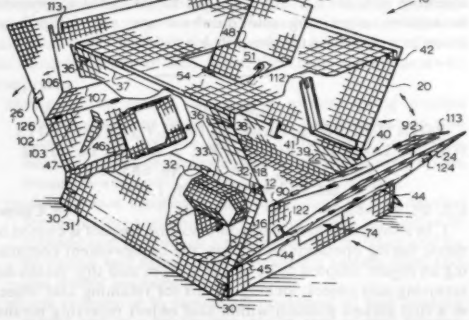
a base member to which said pressing members are pivotally mounted at pivotally supporting portions thereof, so that said pressing members are adapted to form a gable roof at the up-position thereof and are adapted to normally fall down by means of springs provided at said pivotally supporting portions; and

suitable locking means for retaining said pressing members in the up-position thereof in the form of gable roof and adapted to release said pressing members from said up-position thereof when animals contact said locking means while either passing through the hollow triangular case path formed with said pressing members and said base member, or taking a bait preset therein.

4,030,232
COLLAPSIBLE CRUSTACEAN TRAP

Russell N. Niva, P.O. Box 521, Melbourne, Fla. 32901

Filed Oct. 14, 1975, Ser. No. 622,224
Int. Cl.² A01K 69/10
U.S. Cl. 43—105 19 Claims



1. A collapsible trap for catching crustaceans, comprising in combination:

a plurality of movably attached panels, said panels defining an enclosed cavity therein, with at least one of said panels including a first aperture for allowing the entry of said crustacean into said cavity;

means within said cavity for containing bait therein;

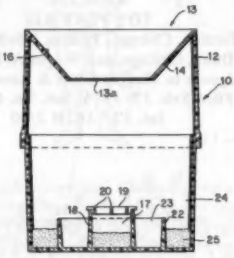
means within said cavity for restraining said crustaceans therein, said restraining means comprising a plurality of restraining partitions movably attached within said cavity for dividing said cavity into upper and lower chambers; and

means for allowing said panels, said bait containing means and said restraining means to collapsibly fold into said cavity, thereby collapsing said crustacean trap.

4,030,233
COCKROACH TRAP

Anton E. Wunsche, 656 W. 162nd St., New York, N.Y. 10032

Filed Dec. 12, 1975, Ser. No. 640,386
Int. Cl.² A01M 1/10
U.S. Cl. 43—121 9 Claims



1. A trap for crawling insects, comprising an upright container adapted to hold a supply of bait and provided with a lid having an aperture and with a bottom part having a bottom wall formed with an annular upstanding partition which defines in said container an inner and an outer compartment, said lid being provided with a downward extension adjoining said aperture and forming a guidepath leading toward said supply of bait but terminating sufficiently short of said bottom wall to prevent an insect attracted by the bait from regaining said extension after landing on said bottom wall, and a slippery coating on the inner peripheral wall of said container for frustrating attempts of the insect to climb said inner peripheral wall; and a moisture-retaining ring of foam-plastic material in one of said compartments.

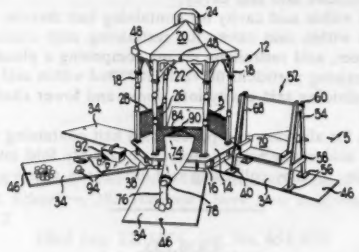
4,030,234
FIGURE TOY PLAY KIT

Robert K. Allen, Hinsdale; Palmer J. Schoenfield, Evanston, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 5, 1976, Ser. No. 655,419
Int. Cl.² A63H 3/52
U.S. Cl. 46—1 R 15 Claims

1. A child's amusement device for child activity with a doll or other toy figure, comprising: a carrying case having a base; a roof; means supporting said roof spaced above said base and securing the roof and base as a unit; a plurality of individual side panels for said case, each side panel separately hingedly connected to the base and pivotally movable relative to the base between (1) a horizontal, open or platform position extending outwardly from the base periphery providing a generally horizontal play area and exposing the interior of the case, and (2) a closed or upright position forming at least a portion of the side wall of the case; a plurality of latch means for releasably holding each panel individually in its upright position with the case thereby closed; and doll play accessory means secured to the interior surface of at least one of said

panels whereby the panel may be folded down from said upright position to said platform position to deliver the accessory means from the interior of the case to the exterior thereof for access and play by the child.



4,030,235

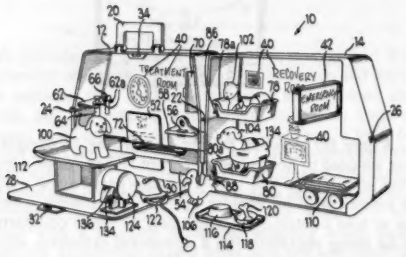
TOY PLAY KIT

Rouben T. Terzian, Chicago; Palmer J. Schoenfield, Evanston; Kathy A. Dunn, Chicago, and Wayne A. Kuna, Oak Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 17, 1976, Ser. No. 658,701

Int. Cl.² A63H *3/00*

U.S. Cl. 46—11 **14 Claims**



1. A child's amusement device in the form of a toy hospital set, comprising:

a portable carrying case simulating an ambulance or other emergency vehicle, said case including first and second mating closable casing halves hingedly connected along a line defining vertical mating edges of the casing halves for opening and closing the case;

selectively operable latch means for releasably retaining the case in closed condition; and

a partition, pivotally mounted to the bottom of said first casing half for folding downwardly generally along a longitudinal axis from a concealed vertical position dividing the case into two portions when the case is in a closed condition to a horizontal position on a suitable supporting surface when the case is open to provide an outwardly extending platform as well as access to the interiors of the two mating casing halves.

4,030,236

TOY BUILDING BLOCKS

Walter Schnabel, Im Wolfsgalgen 25, 7141 Schwieberdingen, Germany

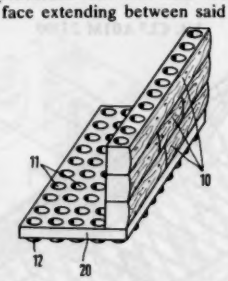
Filed Feb. 4, 1976, Ser. No. 655,230

Claims priority, application Germany, Feb. 7, 1975, 2505109

Int. Cl.² A63H *33/08*

U.S. Cl. 46—25 **9 Claims**

1. A toy building block for interengagement with similarly constructed toy building blocks comprising a unitary plastic member having a first planar contact surface with at least one hole formed therein, a second planar contact surface parallel to said first contact surface with at least one plug extending therefrom, said holes and plugs being in alignment transverse to the plane of said contact surfaces, planar end surfaces extending perpendicular between said contact surfaces, at least one side face extending between said first and second contact surfaces and said end surfaces, said contact surfaces, said end surfaces and said one side face being integral joined along their edges to form an elongated closed rectangular block, said one side face being convexedly formed so as to extend outwardly from a plane containing the edges of said side face connected to said first and second connecting surfaces, and having molded integral thereon a simulating wood graining extending over its entire area.



4,030,237

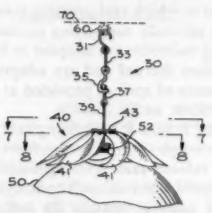
SPINNING BALLOON NOVELTY

Nathanial H. Lewis, Box No. 20424, Los Angeles, Calif. 90006

Filed July 15, 1975, Ser. No. 596,011

Int. Cl.² A63H *3/06*

U.S. Cl. 46—53 **3 Claims**



1. A combination of a pinwheel rotatably attached with a spherical balloon having a stem and a cord of a suspension assembly; a hub member secured with said pinwheel having an aperture centrally located in said hub member, the balloon being inflated and secured to said cord at its stem, said stem of said balloon attached to said cord and said cord being inserted in said aperture of said hub member, the said suspension assembly includes a swivel attached to said cord to provide rotatability, permitting said pinwheel and said balloon to rotate in a circular path along its longitudinal axis.

4,030,238

ROTATING TOYS, PARTICULARLY FLYING TOYS

Willis M. Lakin, P.O. Box 234, Rte. 2, Roselle, Ill. 60172

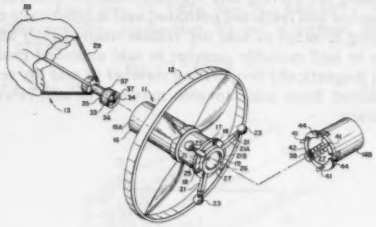
Filed May 4, 1976, Ser. No. 683,053

Int. Cl.² A63H *11/06*, *13/02*

U.S. Cl. 46—86 R **15 Claims**

1. In a toy wherein at least some portion thereof is caused to rotate during operation of the toy, the improvement comprising an object adapted to be released from said toy, means for receiving said object, locking means for retaining said object in a first locked position within said object receiving means, and centrifugal force responsive means for releasing said object from said first locked position upon attainment of a first

level of centrifugal force and maintaining said object in a second locked position until the level of centrifugal force

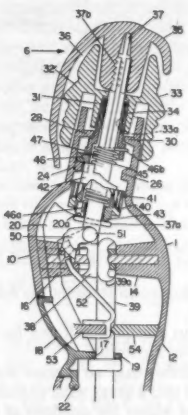


acting on said centrifugal force responsive means diminishes to a second level of centrifugal force.

4,030,239
MULTIPLE FACE DOLL

Peter Charles White, Rancho Palos Verdes; John Terry Benson, Canoga Park, and Richard Anthony Leoncavallo, Anaheim, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 29, 1976, Ser. No. 653,551
Int. Cl.² A63H *13/00*
U.S. Cl. 46—135 R **17 Claims**



7. In a toy figurine of the type containing a torso, a rotatably mounted external appendage thereon, a rotatably mounted head thereon having two faces located on opposite sides of said head and a member fixedly coupled to the torso thereof for concealing one of said faces, the combination therewith comprising:

spring driven means including a torsion spring located within said torso for rotating said head relative to said torso by 180° between first and second detent positions, holding means for releasably holding said spring-driven means in a selected one of said detent positions;

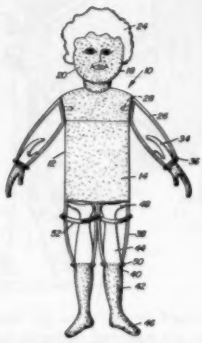
cocking means coupled to said appendage of said figurine for increasing torsional force in said spring responsive to rotating said appendage a predetermined distance and for preparing said spring driven means for release from said one detent position; and

means responsive to sequential operation of said cocking means and to a pushbutton at the rear of said figurine torso for causing said holding means to release said spring driven measn from said one detent position to permit said spring driven means to turn said head substantially instantaneously by 180°.

4,030,240
CONVERTIBLE DOLL WITH PIVOTED CHANGEABLE HANDS

Beverly A. Port, 5098 E. Hillcrest, Port Orchard, Wash. 98366

Filed Apr. 19, 1976, Ser. No. 678,173
Int. Cl.² A63H *3/12*
U.S. Cl. 46—153 **10 Claims**

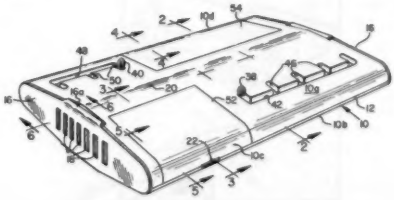


1. A convertible doll comprising a body having a head at the upper end and defining a shoulder region, waist region and hip region, arm members attached to the shoulder regions and leg members attached to the hip region, each arm member including a double hand at the outer end thereof with the two hands on each arm having distinguishable appearance characteristics, and means mounting the double hands for pivotal movement about a transverse axis intermediate the extermities of the hands to enable one of said hands to be positioned as a longitudinal extension of the arm member.

4,030,241
MULTIPLE PITCH ANIMAL CALL

H. Dan Gallagher, 902 SE. 119th, Vancouver, Wash. 98664

Filed Apr. 29, 1976, Ser. No. 681,413
Int. Cl.² A63H *5/00*
U.S. Cl. 46—180 **15 Claims**



1. A multiple pitch animal call comprising:

a casing defining a mouthpiece means having exterior mouthpiece opening means leading into an interior air space within said casing,

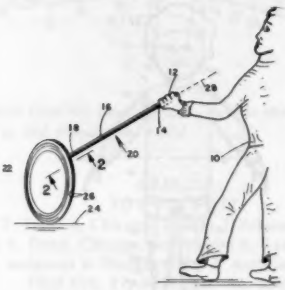
at least two stretchable elastic bands within said casing,

band-positioning means within said casing positioning an edge portion of each said band inwardly of said mouthpiece opening means so that when a stream of air is blown into said interior space through said mouthpiece opening means it vibrates one or the other of said bands and thereby produces a sound,

and band-stretching means for each band movably mounted within said casing and operable from the exterior of said casing for variably stretching each band independently of

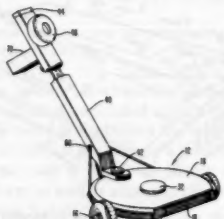
the other band so that each band can produce sounds of variable pitch.

4,030,242
HOOP AND PROPELLED MEANS
Cruz Sintron, 279 N. Broadway, Yonkers, N.Y. 10701
Filed May 21, 1976, Ser. No. 688,598
Int. Cl.² A63H *33/02*
U.S. Cl. 46—220 **6 Claims**



1. A hoop and propelling means comprising a propelling device, said propelling device having an elongated rod-like shape, a circular hoop, one end of said propelling device for manual grasping by the user, the other end of said propelling device for selective engagement with the exterior surfaces of said hoop, snap-like engagement means for capturing said other end of said propelling device along a first annular mouth passing through said exterior surfaces of said hoop, frictional engagement means for frictionally engaging said other end of said propelling device along a second annular mouth passing through said exterior surfaces of said hoop.

4,030,243
PUSH TOY
Howard Drucker, 35 Great Rock Road, Sherbon, Mass. 01770
Continuation-in-part of Ser. No. 623,560, Oct. 17, 1975. This application Apr. 12, 1976, Ser. No. 676,236
Int. Cl.² A63H *33/26*
U.S. Cl. 46—241 **10 Claims**



1. A push toy configured to interact magnetically with a toy vehicle having a magnetically cooperating member, said push toy comprising:

a. a base;

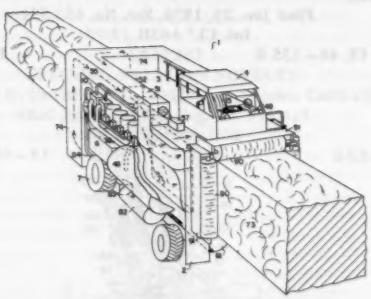
b. at least a pair of side wheels mounted to said base;

c. a movable magnetically cooperating member mounted to said base, said movable member constrained for movement between extended and retracted positions relative to a forward end of said base;

d. a control stick mounted to said base at a rearward portion thereof, said control stick extending outwardly from said base and defining a handle for maneuvering said push toy; and

e. control means operatively connected to said movable member for moving said movable member between said extended and retracted positions, said magnetically cooperating member of said toy vehicle magnetically attachable to said movable member in said extended position, said magnetically cooperating member of said toy vehicle detached from said movable member in said retracted position.

4,030,244
METERING AND SPRAY APPARATUS FOR HORTICULTURAL APPLICATIONS
Bernard R. Tennes, Charlotte, and Clyde L. Burton, East Lansing, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed May 14, 1976, Ser. No. 686,424
Int. Cl.² B05B *1/28*
U.S. Cl. 47—1.7 **13 Claims**



1. An apparatus for spraying materials onto horticultural plants comprising:

a power frame adapted to straddle the foliage of said horticultural plants,

means attached to said power frame for suspending spray materials into an air stream,

means for conducting said air stream with said suspended spray materials into a spray zone containing said horticultural plants and within the confines of said power frame,

means for recirculating said air stream from said spray zone to said suspending means, and

at least one metering means mounted on said power frame for metering at least one spray material to said suspending means, said metering means comprising:

a container for holding said spray material, said container having an opening,

an adapter for removably mounting said container and for permitting passage of said spray material through said container opening to a first conduit means, and for permitting return of said spray material through said container opening from a second conduit means,

an agitating pump for circulating said spray material through said first and second conduit means, and

a metering pump for metering said spray material to said suspending means, said metering pump connected to said second conduit means by a third conduit means, and further connected to said suspending means by a fourth conduit means, and wherein said metering pump is driven by a power shaft which rotates in direct proportion to the distance traveled by said power frame.

4,030,245

CHANNEL-SHAPED SEALING AND FINISHING STRIPS

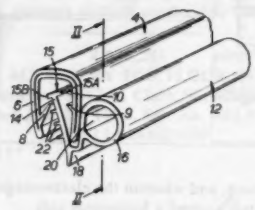
Frederick G. Yeomans, Kenilworth, England, assignor to Draftex Development AG, Switzerland

Filed Jan. 12, 1976, Ser. No. 648,007

Claims priority, application United Kingdom, Sept. 13, 1975, 37729/75

Int. Cl.² E06B 7/23

U.S. Cl. 49—490 15 Claims



1. A channel-shaped sealing strip for straddling a flange or the like, comprising

a longitudinal channel-shaped gripping portion having a longitudinally extending rib on at least one internal wall of the channel and spaced from the base of the channel by a predetermined distance,

a longitudinal sealing portion on and running along the outside of the gripping portion, the contacting surfaces of the sealing portion and the gripping portion being unconnected at their points of contact, and

a longitudinal support which extends at least partially over the outside of the said one wall of the channel of the gripping portion and into the said channel, is spaced from and movable relative to the said one wall of the cahnnel when the gripping portion is not straddling the said flange or the like, and has a longitudinally extending enlarged head which engages the distal edge of the said rib on the said one wall to hold the gripping portion and the sealing portion together,

the said predetermined distance being such that the head is held on the said rib by the said flange or the like when the latter is embraced, by, and has pushed home onto it, the gripping portion, thereby preventing separation of the gripping and sealing portions, the head being held spaced from the base of the channel.

4,030,246

SLIDING BARN DOOR

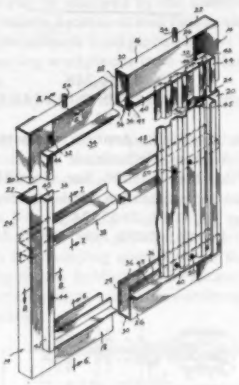
Donald B. Naylor, Rte. 4, Box 357, Plymouth, Ind. 46563

Filed July 30, 1975, Ser. No. 600,713

Int. Cl.² E06B 3/12

U.S. Cl. 49—501 5 Claims

1. A barn door comprising a pair of vertical side frame members, a horizontal top frame member and a horizontal bottom frame member, said frame members being joined at their respective end portions to define a four-sided opening between the frame members, a girt supported by and extending between said side frame members, siding applied over one side of said girt and covering said opening between the frame members, and means associated with said top frame member for securing said door to a barn support for opening and closing movement of the door, each frame member including a side located within the same general plane as said one girt side and defined by an outer edge which forms a part of the outside perimeter of the door and an inside edge which forms a part of the perimeter of said opening between the frame members, each frame member including a flange projecting outwardly from its said side and spacedly parelleling its said inside edge, said flanges forming a four-sided frame part about said opening, said siding fitted within said frame part and overlapping said frame members where said flanges are spaced from the inside edges of the frame members, each side frame member having a U-shaped cross sectional configuration including its said side and a spaced second side interconnected at the outer edge of the frame member by a web, the



end portions of said top and bottom frame members fitting into said side frame members between the spaced sides of the side frame members.

4,030,247

DEVICE FOR REMOVING BURRS FROM WORKPIECES

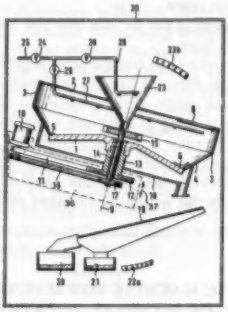
Peter Grund, Solingen; Jurgen Schmidt, Herborn, and Jurgen Hesse, Dusseldorf, all of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Apr. 14, 1976, Ser. No. 676,906

Claims priority, application Germany, Apr. 16, 1975, 2516721

Int. Cl.² B24C 3/18

U.S. Cl. 51—419 13 Claims



1. Device for removing burrs from workpieces made of rubber or similar materials which can be embrittled by cold comprising an axisymmetrical disposed container for receiving the workpieces, the bottom of said container being detached from the container side wall, means for rotating said bottom, said side wall being stationary, means for supplying a liquefied gas with a low boiling point and a blasting agent into said container, said supply means including a fan blower disposed within said container perpendicular to the axis of said container, the axis of rotation of said fan blower being coaxial and identical to the rotational axis of said bottom, said rotational axis being inclined by 5° to 25° with respect to the

vertical, and said bottom having its outer surface in the form of a downwardly and outwardly extending circular cone with a conical angle of 130° to 170°.

4,030,248

METHOD AND APPARATUS FOR MAKING FILAMENT CABLES

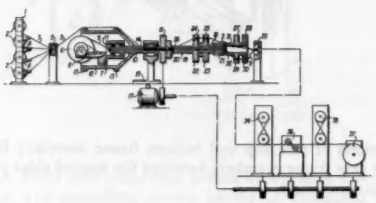
Leendert Van Assendelft, Arnhem, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed May 3, 1976, Ser. No. 682,262

Claims priority, application Netherlands, May 12, 1975, 7505523; May 12, 1975, 7505524

Int. Cl.² D07B *3/00*; D02G *3/48*

U.S. Cl. 57—9 **10 Claims**



4. An apparatus for cabling filaments comprising

a horizontal rotor having a bore therein;

means for rotating the rotor,

a plurality of eccentrically positioned filament guide openings mounted on the rotor, at least some of said guide openings being provided with deflection edges having a small radius of curvature for deforming filaments passing therethrough,

a plurality of filament delivery spools for supplying filaments to the rotor,

means for bundling the filaments run-off from said spools outside the rotor,

means for guiding the bundle into the bore of the rotor and out of the bore,

means for guiding the bundle after it emerges from the bore to the cable-forming device, said guide means comprising at least one guide opening having a deflecting edge,

a means for guiding at least one wrapping filament into the bore of the rotor separately from the bundle, and

means for guiding the said wrapping filament to the cable forming device, whereby the cable-forming device helically winds the wrapping filament about the bundle.

4,030,249

AUTOMATIC MACHINE FOR MAGNETIC ABRASIVE POLISHING OF INTERNAL ROTATIONAL SURFACES

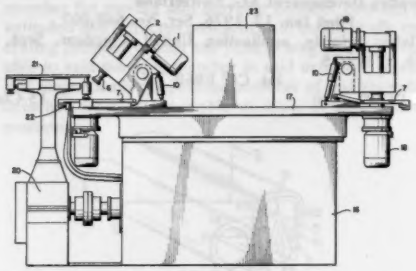
Atanas Dimitrov Kochemidov; Boris Georgiev Makedonski; Ivan Minkov Dumanov; Stefan Georgiev Payakov; Peter Konstantinov Galabov, and Haralampi Aangelov Atanassov, all of Sofia, Bulgaria, assignors to Zniitmash, Sofia, Bulgaria

Filed Oct. 2, 1975, Ser. No. 618,939

Int. Cl.² B23C *3/05*

U.S. Cl. 51—105 R **3 Claims**

1. An automatic machine for magnetic abrasive polishing of internal rotation surfaces, especially internal race-ways of antifriction bearings, by means of an electromagnetic inductor and ferromagnetic powder, comprising a rotating table mounted on a casing with a plurality of working positions having means for receiving and chucking workpieces wherein on each working position there is an electromagnetic head means with a rotating magnetic tip adapted to be introduced into a workpiece received by a position without touching the



processed surface, and wherein the electromagnetic heads are vertically rotated around a horizontal axis.

4,030,250

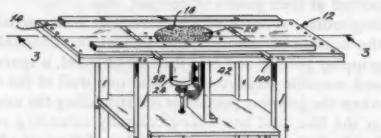
DEVICE FOR ACCURATELY SANDING OBJECTS SUCH AS WOODEN OBJECTS AND THE LIKE

Leonard B. Walker, 903 S. Washington, Farmington, Mo. 63640

Filed May 20, 1976, Ser. No. 688,387

Int. Cl.² B24B *7/08*

U.S. Cl. 51—128 **13 Claims**



1. A device for sanding surfaces of wooden boards and like objects comprising a platform member having a substantially flat surface over which objects to be sanded are to be moved, said platform member having a round opening formed at an intermediate location therein, means for supporting said platform member in an operative position, motor means positioned on one side of said platform member, said motor means including a motor shaft which extends substantially in axial alignment with said opening, said shaft having an end portion located adjacent to the opening, means for supporting the motor means including means to reposition the end portion of said shaft relative to the opening in the platform member, said motor support means including a first support member attached to the platform member and oriented to extend in substantially perpendicular relationship thereto, said motor means being attached to said first support member, and second motor support means including a second support member spaced from the platform member, means connecting the first support member to the second support member at substantially a right angle, and means associated with said second motor support means to adjust the position of the motor means and of the motor shaft relative to the opening in the platform member, said last named means including an adjustable motor support member having spaced opposite end portions, one of the opposite end portions engaging the motor means opposite from the platform member, and means on said second support member for supporting said adjustable motor support member adjacent to the other opposite end portion thereof, means to adjust the orientation of the first motor support member relative to the platform member including means to adjust the angular relation between the first and

second motor support members, a disc-like member attached to the end portion of the motor shaft, said disc-like member having means forming an abrasive surface thereon, said disc-like member being positioned to be rotated in the opening in the platform member with the abrasive surface in substantially coplanar relationship with said flat surface of the platform member, and guide means on the platform member including a pair of spaced parallel guide members positioned adjacent opposite sides of the opening for guiding objects to be sanded as they are moved over the opening in the platform member and across the abrasive surface on the disc-like member.

4,030,251

BRUSH ACCESSORY FOR FLOOR SANDERS

William A. Boettcher, 4507 N. Clark St., Chicago, Ill. 60640

Filed Jan. 30, 1976, Ser. No. 653,913
Int. Cl.² B24B *23/00*
U.S. Cl. 51—177 **7 Claims**

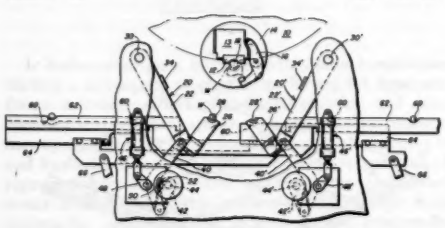
1. In combination with the horizontal base of a floor sanding machine having suction means in the base; a holder freely surrounding the base and a brush directed downwardly from the holder to floor contact, the brush also surrounding the base, the holder and brush being spaced radially from the rim of said base for vertical and radial movement relative to said base; and a cover extending radially along and beyond the top of the base and over the holder with a downbend at its periphery spaced from the holder to restrain and control movement of said holder relative to said base and to direct the entrance of outside air into the base by way of said brush.

4,030,252

WORKPIECE TRANSPORTING STRUCTURE FOR USE WITH A CYLINDRICAL GRINDER

Ralph E. Price, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.

Filed June 3, 1976, Ser. No. 692,702
Int. Cl.² B24B *41/00*
U.S. Cl. 51—215 R **1 Claim**



1. A workpiece transporting structure for use with a cylindrical grinding machine having a workpiece clamping assembly comprising

means for delivering workpieces to the clamping assembly including

a plurality of laterally spaced workpiece support means,

lift and carry means for sequentially advancing supported workpieces to the forwardmost workpiece support means,

loading arm means having workpiece holding means and means for displacing said workpiece holding means from a first position to a second position whereat a held workpiece can be clamped by the clamping assembly,

said holding means, located at said first position, comprising said forwardmost workpiece support means, and

means for removing workpieces from the clamping assembly including

a second plurality of laterally spaced workpiece support means,

lift and carry means for sequentially advancing workpieces from the rearwardmost workpiece support means of said removing means,

unloading arm means having workpiece holding means and means for displacing said holding means from a first position to a second position whereat a workpiece clamped in the clamping assembly can be held,

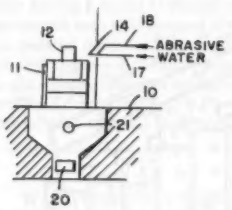
said unloading means holding means located at said first position, comprising said rearwardmost workpiece support means.

4,030,253

METHOD OF CASTING BENEFICIATION

William R. Barber, Jr., Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Apr. 14, 1976, Ser. No. 676,677
Int. Cl.² B24C *1/00*
U.S. Cl. 51—321 **7 Claims**



1. A method of removing adherent deteriorated surface material from metal castings comprising positioning said surface at a distance of from about 4 inches (10 cm.) to about 6 inches (15 cm.) from a jet nozzle, flowing a water-abrasive mixture through said nozzle into impinging relation with said surface at a pressure of from about 8,000 psi (550kg/cm²) to about 12,000 psi (850kg/cm²) at a flow rate of from about 10 gpm (38 liters/min.) to about 12 gpm (45 liters/min.) and including from about 5 lbs/min. (2.2kg/min) to about 7 lbs/min. (3.2kg/min) of an abrasive having a particle size in the range capable of passing an SAE size 14 screen but retainable on an SAE size 40 screen, said abrasive having a crystal structure characteristic of garnet sand.

4,030,254

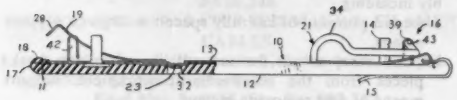
SANDING SHOE WITH REMOVABLE CLAMPING JAW

Livio F. Marcantonio, Utica, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Mar. 5, 1976, Ser. No. 664,250
Int. Cl.² B24D *17/00*
U.S. Cl. 51—386 **2 Claims**

1. A sanding shoe comprising an elongated spring metal support plate adapted for bolting to a reciprocable carrier plate in a portable sanding tool, an elongated rectangular elastomeric pad in which the support plate is moulded, the pad providing a cushion backing for a sheet of sandpaper extended over its bottom surface, separate clamping means detachably mounted upon opposite upper end areas of the shoe for

clamping in place opposite ends of the sandpaper extending over corresponding ends of the shoe, the support plate and the pad being flexible as a unit in moving over curved surfaces during operation of the tool, each of said clamping means including a spring metal flexible clamping jaw element having a rear end removably interlocked with the support plate and having a jaw end inherently biased angularly upward from the shoe in an open condition, a bearing element integral with the



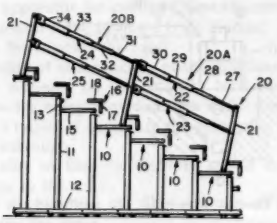
support plate and extending upwardly therefrom above the surface of the shoe, and a manipulative lever pivotable in the bearing and having a camming arm in overlying relation to the jaw end of the clamping jaw element, said support plate including a slot, the clamping jaw element including a tailpiece at its rear end insertable into the slot, said jaw end of the clamping jaw element being inherently biased upwardly against the camming arm of the lever.

4,030,255

FOLDING HANDRAIL SYSTEM FOR TELESCOPING SEATING SYSTEMS

Arlin Philip Hartman, Champaign, Ill., assignor to Universal Bleacher Company, Champaign, Ill.

Filed June 28, 1976, Ser. No. 700,158
Int. Cl.² F04H 3/12
U.S. Cl. 52—9 **8 Claims**



1. In combination with a telescoping seating system having a plurality of rows movable between an extended use position in which said rows are in stepped relation and a retracted position in which said rows are in superposed relation, a telescoping handrail comprising at least a pair of posts, one mounted to an upper row and the other to a lower row, a handrail comprising a plurality of telescoping tubular elements forming a rail assembly; means for pivotally mounting the lower end of said rail assembly to one of said posts; a sleeve slidably received on the uppermost tubular element of said rail assembly; and link means pivotally connected at one end to said sleeve and pivotally connected at the other end to the other of said posts.

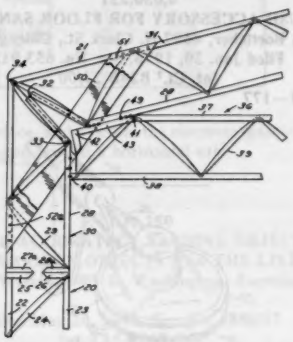
4,030,256

BUILDING CONSTRUCTION

Melvin L. Ollman, 16730 Huntington, Detroit, Mich. 48219

Filed Nov. 20, 1975, Ser. No. 633,644
Int. Cl.² E04B 7/00; E04C 3/02
U.S. Cl. 52—90 **11 Claims**

1. In a building construction, the combination comprising
a foundation,
a plurality of vertically extending truss members,
each said truss member comprising spaced channels with alternately struts connected between said channels,
a roof frame associated with each opposed pair of said vertically extending truss members,
each roof frame comprising truss members including spaced outer and inner channels with alternately extending struts connected between said channels,
said roof frame having an upright portion at each end thereof defining a leg having the spaced outer and inner channels thereof extending vertically and alternately extending struts connected between said channels, said channels of said leg being aligned with a vertically extending truss member,
and means joining each said leg of said upright roof frame and its respective vertically extending truss member,
said roof frame having an inclined portion extending upwardly and inwardly from each said leg of said roof frame,



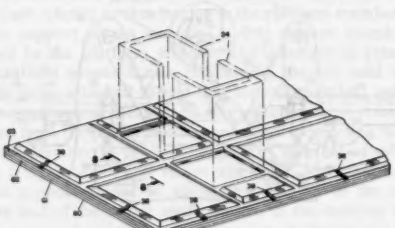
said leg of said roof frame having a strut extending the outer channel thereof at the juncture of the outer channel of said leg of said roof frame with said outer channel of said inclined portion,
and said inclined portion including a strut extending to said area of juncture of said outer channel of said inclined roof portion and the outer channel of said leg of said roof frame,
and a gusset plate fastened to a juncture of a pair of said strut members and said outer channel of said leg and fastened to the juncture of a pair of said strut members and said outer channel of said inclined portion.

4,030,257

FOLDED SLAB FLOOR CONSTRUCTION AND METHOD

Allan S. Labie, New York; Charles Thornton, Pleasantville; Irwin Paul Lew, Forest Hills, and Abraham Gutman, Old Bethpage, all of N.Y., assignors to International Environmental Dynamics, New York, N.Y.

Filed Mar. 4, 1975, Ser. No. 555,329
Int. Cl.² E04B 1/35, 1/34
U.S. Cl. 52—126 **28 Claims**



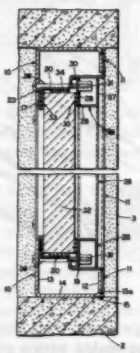
1. In a building having at least one vertical structural member supported on a foundation at its lower end and extending upwardly at least a partial height of a building at its upper end, a plurality of stacked floors at the base of said vertical structural member; and, means for raising and fastening said floors

with said top floor of said stack being raised first to an upper supported elevation for support by said vertical structural member and said lower floor of said stack being raised second to a lower supported position by said vertical structural member, the improvement in said plurality of stacked floors comprising: a plurality of stacked floor slabs; each said floor slab including at least first and second poured and cured horizontal reinforced concrete slab sections of substantially the same vertical thickness for defining in side-by-side relation the major planar supporting surface of said floor; a fold of reinforced concrete of said same vertical thickness disposed along a path across each said floor between said first and second slab sections, said fold defining an upwardly exposed depression and rigidly joined at one upper extremity to said first slab portion and rigidly joined at its other upper extremity to said second slab portion to fasten said slab portions in side-by-side relation with the lowest point of said fold extending below the lower surface of said slabs and forming at least part of a first and lower beam flange disposed along said substantially linear path and said first and second slab portions as rigidly attached adjacent said fold forming at least part of a second and upper beam flange disposed along said linear path to support and stiffen each said floor, each said floor slab being nestable with an adjacent floor slab with its respective first and second slab sections and upwardly concave fold of reinforced concrete there betweeen immediately adjacent at a surface of said floor to corresponding and identical overlying undersurfaces of said stacked overlying floor slabs.

4,030,258
BANK WINDOW CONSTRUCTION

Walter G. Anders, Canton, Ohio, assignor to Diebold, Incorporated, Canton, Ohio

Filed Oct. 12, 1976, Ser. No. 731,123
Int. Cl.² E06B *5/00*
U.S. Cl. 52—208 **7 Claims**

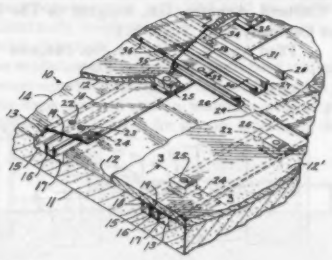


1. Bullet-proof glass bank window frame construction including a rectangular support frame having sill, head and end frame members; offset glass-panel-receiving and retainer-frame-receiving recesses formed in the support frame members opening toward the central portion of the support frame and located between the outside and inside portions of the support frame; a glass panel located in the panel-receiving recess adjacent the inside portion of the support frame; a rectangular retainer frame located in the retainer-frame-receiving recess adjacent the outside portion of the support frame; the retainer frame having pressure areas facing and adjacent the perimeter of the glass panel; sealing strip means in the panel-receiving recess between the support frame and the pressure areas and perimeter surfaces of the glass panel; clamping bolt means accessible at the inside portion of the support frame and extending through the support frame and engaging the retainer frame to retain the glass panel in the panel-receiving recess; and the clamping bolt means when tightened compressing the sealing means around the periphery of the glass panel to provide a weather-proof seal.

4,030,259
METHOD FOR FORMING WIRING CHANNELS IN A CONCRETE FLOOR

Gershon Meckler, 7425 Democracy Blvd. - Unit 212, Bethesda, Md. 20034

Filed Dec. 10, 1975, Ser. No. 639,295
Int. Cl.² E04B *5/48*
U.S. Cl. 52—221 **3 Claims**

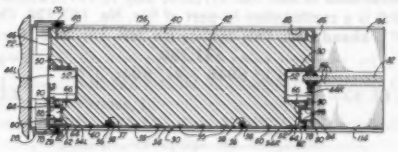


1. A method for forming a plurality of electrical wiring ducts in a building floor comprising the steps of: pouring a floor slab from a hardenable material; forming at least one trench in the upper surface of said poured floor slab before such material hardens; after such material hardens, placing a metal cover plate having a metal U-shaped channel attached thereto over said trench with said channel dividing said trench into at least two parallel ducts with one duct defined by said cover plate and said U-shaped channel; selectively attaching access boxes to the upper surface of said cover plate for providing access into said ducts, and pouring a surface layer of a hardenable material over said slab and said cover plate.

4,030,260
WALL CONSTRUCTION

Ronald D. Sukolics, Elkhart, Ind., and Lawrence F. Biebuyck, Dallas, Tex., assignors to Kawneer Company, Inc., Niles, Mich.

Continuation of Ser. No. 539,299, Jan. 8, 1975, abandoned. This application Nov. 26, 1975, Ser. No. 635,761
Int. Cl.² E04B *1/62*; E04H *1/00*
U.S. Cl. 52—397 **28 Claims**



1. A wall construction including a panel member having spaced apart inside and outside faces and edge members along opposite longitudinal sides of said panel between said faces; said outside face comprising at least one sheet of weather resistant material having a plurality of spaced apart longitudinal grooves formed in the outer surface thereof and having tongue or groove means along at least one longitudinal edge interfitted with tongue or groove means in at least one of said edge members forming a groove on the outside of said panel parallel of said grooves in said outside face; said one edge member comprising an outside element of generally angular cross-section having an outside leg interfitted with said tongue or groove means of said outside face and a transverse leg extending inwardly of said outer face, an inside element hav-

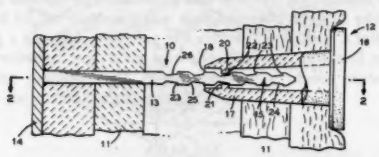
ing a leg extended transversely outwardly of said inside face and interconnected therewith, and a glazing pocket element of channel shaped cross-section having a pair of spaced apart legs on opposite sides of a web portion and transverse thereof, said pocket element legs being interconnected with said transverse leg of said outside element and said leg of said inside element; and structural foam insulation means secured between said inside and outside faces and engaging inner surfaces of said edge members.

4,030,261

CERAMIC CAP FOR INSULATION ANCHOR

Bob G. Coleman, Augusta, Ga., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 8, 1975, Ser. No. 566,644
Int. Cl.² E04B *1/40*
U.S. Cl. 52—511 **7 Claims**



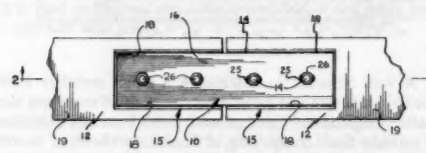
1. An anchor for fiber insulation of a furance comprising an elongate metallic stud of rectangular cross-section affixed at one end to a furnace wall, the stud having a plurality of notches cut in an opposite end portion thereof, insulating material lining the interior of the furnace and including at least some thickness of resilient ceramic fiber blanket, the length of the stud being less than the thickness of insulating materials lining the furnace, a tubular ceramic cap open and inwardly tapering at one end and having its opposite end enclosed and integrally formed with a refractory flange, the inner wall of the cap being formed with an inwardly extending ceramic collar provided with a slot-like opening of a configuration corresponding to and slightly larger than the cross section of the stud to engage the notches in the stud within the furnace lining and to retain the insulating materials on the wall, whereby the resiliency of the insulating materials forces the cap into the locking engagement with the notches.

4,030,262

BUILDING PANEL CONNECTOR ASSEMBLY AND THE LIKE

Almeta C. Dean, 1681 La Cresta Drive, Pasadena, Calif. 91103

Continuation of Ser. No. 377,220, July 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 187,726, Oct. 8, 1971, abandoned. This application Jan. 15, 1975, Ser. No. 541,280
Int. Cl.² E04B *1/41*; E04C *5/16*
U.S. Cl. 52—583 **3 Claims**



1. A connector assembly for connecting together adjacent structural modules in a building of substantially modularized construction, the connector assembly comprising

a pair of anchor assemblies each including an elongated metal anchor channel and means for rigidly securing each channel in an upwardly open disposition to a horizontal upper edge of a module adjacent a vertical edge thereof to be aligned with and substantially contiguous to the other anchor channel of the pair in a building for intimate mating receiving engagement between the flanges thereof with a connector plate of the connector assembly, the securing means for each anchor channel including elongate means connected to the channel to extend substantially normal to the channel and adapted to be embedded in the material of a module,

an elongate connector plate configured to mate within the anchor channels of the anchor assemblies intimately between the flanges thereof,

a pair of threaded fasteners cooperating between each anchor channel at spaced locations therealong through corresponding apertures in the connector plate for coupling the connector plate and the anchor assemblies in said mated engagement, the fasteners in said cooperation being fixed from movement relative to the respective channel in a direction along the elongate extent of the channel,

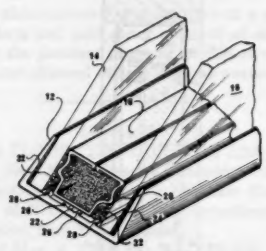
the connector plate fastener apertures associated with one anchor channel of the pair thereof being round and sized to mate intimately with the corresponding fasteners for securing the connector plate fixedly to the one channel, the connector plate fastener apertures associated with the other anchor channel being oversized for connecting the connector plate to the other anchor channel and, in cooperation with said mated engagement of the connector plate with said other channel, for constraining the other channel to move relative to the connector plate only in the direction of the elongate extent of the other channel.

4,030,263

PROTECTIVE CAPPING CHANNEL FOR GLASS SEALED UNIT

Gaetan Y. Lacombe, Duvernay, Canada, assignor to D.C. Glass Ltd., Ville D'Anjou, Canada

Filed Nov. 11, 1975, Ser. No. 630,771
Int. Cl.² E04B *2/28*; E06B *3/24*
U.S. Cl. 52—616 **10 Claims**



1. A protective capping channel for a glass sealed unit of the type having a rigid spacer sealed with a polysulphide sealant between the edges of two panes of glass, the said channel comprising a thermally non-conducting rigid plastic U-shaped member, the said member having a flat base and two integral lateral walls slightly tapering towards each other, the distance between the said walls adapted to cover the edges of panes of glass spaced by a spacer, the said base having short thin ribs integrally projecting on the inner surface of the base of said channel, the said ribs projecting angularly relative tothe said surface of the base and having a lip projecting sidewise from the free end of the said ribs,

whereby the said lip of the ribs are adapted to abut against the spacer and to maintain the said spacer at a distance from the base of the channel and to allow retention of the channel to the sealant.

6. In a glass sealed unit comprising a pair of panes of glass arranged in spaced relationship to form an air space therebetween, a rigid spacer disposed between the marginal edges of the panes of glass, a protective capping channel disposed over the marginal edges of the panes of glass to maintain the said

panes in adjacent relationship with the spacer, and a polysulphide sealant spread between the panes and the spacer and between the panes and the capping channel, the improvement consisting in the said channel being a thermally non-conducting, rigid, plastic U-shaped member, the said member having a flat base and two intergral lateral walls slightly tapering towards each other, the said base having short, thin ribs integrally projecting on the inner surface of the base of said channel, the said ribs projecting angularly relative to the said surface of the base and having a lip projecting sidewise from the free end of the said ribs,

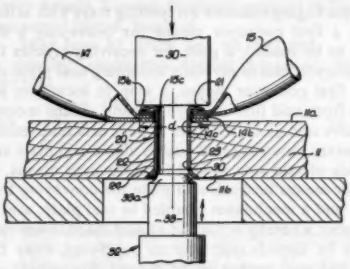
whereby the said lips abut against the spacer to maintain the latter at a distance from the base, the said distance allowing a layer of sealant between the spacer and the base of said channel, the said ribs and lips being immersed in the sealant to assure a positive retention of the channel to the sealant.

4,030,264

WOOD RIVET AND METHOD OF INSTALLATION IN A TRUSS

Edgar D. Jackson, Alta Loma, Calif., assignor to Steel Web Corporation, Alta Loma, Calif.

Filed Apr. 12, 1976, Ser. No. 675,977
Int. Cl.² E04C *3/12, 3/17*
U.S. Cl. 52—693 **3 Claims**



1. In a truss, the combination comprising

a. upper and lower wooden chord members extending in generally the same longitudinal direction and in spaced apart relation,

b. metallic webs extending in zig-zag configuration in the space between the chord members, each web having opposite ends which are generally flat, the flat ends of successive webs extending in overlapping relation and containing aligned openings, and

c. metallic fasteners attaching the overlapping ends of the webs to the chord members, each fastener comprising a head overlying a pair of overlapping web ends and a generally tubular shank extending through said openings in said ends, and also through an opening formed in the adjacent chord member, the shank having a bell-shaped flaring end portion which is entirely within the confines of the chord member and radially outwardly deformed in the chord member compressing and deforming the wood adjacent the outer side of the flare, the end portion terminally in substantially flush relation with a surface of the chord member, said flared end portion being at the outerside of the chord member opposite said web flat ends.

4,030,265

ARCH BEAMS AND PLATES

Jay R. Allgood, 1888 Lyndhurst, Camarillo, Calif. 93010

Filed Oct. 24, 1975, Ser. No. 625,395
Int. Cl.² E04C *3/34, 3/10*
U.S. Cl. 52—723 **18 Claims**

1. A low-rise light-weight synergistic arch-beam utilizing elastic support to vastly increase the transitional buckling load of a shallow arch and permitting large reductions in dead load, comprising:

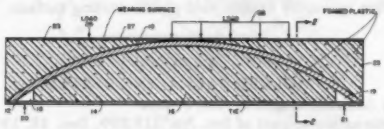
a. a compression element in the form of an elongated low-rise arch member of high compression strength material;

b. a tie element of high tensile strength material;

c. the opposite ends of said arch member being fastened to respective opposite ends of said tie element such that the opposite ends of said arch member react against each other through said tie element; said joined arch member and tie element being supported at said opposite ends thereof;

d. an elastic support means of low modulus material filling the space between said arch and said tie element and being internally confined therebetween to form a tied arch-beam structure;

e. said low modulus material operating to hold said arch and tie element apart except where fastened together at said opposite ends thereof and to maintain proper position with respect to each other for greatly increasing the transitional buckling load of the resultant arch-beam structure such that the arch-beam structure transfers load in essentially pure compression through said arch member to said supports at the opposite ends thereof; said elastic support means of low modulus material allowing a significant decrease in the material normally required for forming said low-rise arch member and still support a given load that would otherwise exceed the buckling load of said arch member and normally cause collapse of the low-rise arch member;



f. the tensile strength of said tie element normally determining the failure mode of the arch-beam structure;

g. said synergistic arch-beam providing greater ease in deflection control over conventional flexural elements, thereby permitting a much greater percentage of available resistance to be utilized in carrying live loads; the limitations of ordinary shallow arches and the inefficiency of conventional flexural elements being eliminated therein.

4,030,266

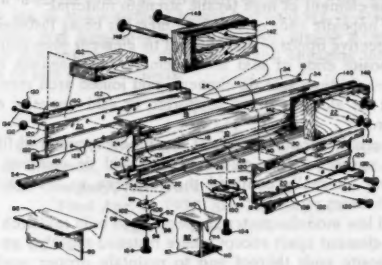
INVERTABLE, MULTI-PURPOSE STRUCTURAL CLAMP

David L. Cody, Hoffman Estates, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Division of Ser. No. 658,515, Feb. 17, 1976. This application June 21, 1976, Ser. No. 697,930
Int. Cl.² F16B *5/06*
U.S. Cl. 403—405 **2 Claims**

1. A reversible clamping member for selectively clamping a length of channel stock and a length of I-beam stock in fixed positions against the underneath side of a planar seating surface, said clamping member embodying a body portion having a bolt hole formed therein substantially centrally thereof, one side of said body portion being provided with a transverse trough therein adapted to underlie and receive a downturned rib which is formed on one horizontal side of the length of channel stock when the clamping member is in one position with said trough facing upwardly, the other side of said body portion being provided with a series of transverse gripping ribs adapted to underlie one of the flanges on the length of I-beam stock when the clamping member is inverted with said ribs facing upwardly, said series of ribs and said trough being

disposed on opposite sides of said bolt hole, said bolt hole being designed for selective reception of a clamping bolt



therethrough in opposite directions for drawing the body portion upwardly against said planar seating surface.

4,030,267
MOLDED PACKAGING SYSTEM

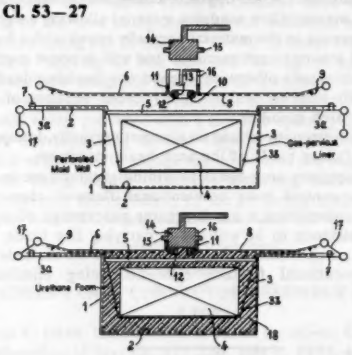
Guy Arnaud, Magnieu, Ain, France

Continuation-in-part of Ser. No. 315,899, Dec. 18, 1972, Pat. No. 3,952,082. This application Oct. 16, 1975, Ser. No. 623,102

Claims priority, application Switzerland, Dec. 16, 1971, 18363/71

Int. Cl.² B65B *23/00*

U.S. Cl. 53—27 **5 Claims**



1. A method of packaging an object comprising the steps of:

lining the perforated walls of a mold with a gas-pervious sheet;

supporting said object in said mold spaced from said sheet;

thereafter covering said mold with a perforated cover lined with another such gas-pervious sheet, said gas-pervious sheets being constituted by a plurality of flat panels each having an outer wall, an inner wall parallel to said outer wall, and a plurality of parallel webs interconnecting said inner and outer walls and defining a plurality of parallel passages therebetween, said inner and outer walls being formed with throughgoing holes opening into said passages;

thereafter pouring into said mold over said object foamable polyurethane material;

thereafter expanding said material in said mold with the generation of gas while venting said gas to the atmosphere over substantially all of the interior surfaces of said mold;

forcing said material only through the holes of said inner walls into said passages on expansion of said material whereby said passages and the holes of said outer walls remain substantially free from said material; and

thereafter polymerizing said material into a rigid foam weighing between 30 g and 50 g per dm^3 and having a multiplicity of cells at least 96% of which are closed.

4,030,268
PACKAGING MACHINE

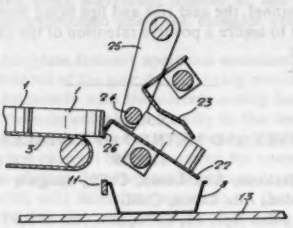
Richard Payne, Barton Turf, England, assignor to Thurne Engineering Company Limited, Norfolk, England

Filed July 13, 1976, Ser. No. 704,961

Claims priority, application United Kingdom, July 18, 1975, 30286/75

Int. Cl.² B65B *57/02, 57/10, 39/12*

U.S. Cl. 53—55 **9 Claims**



1. A packaging machine for loading trays with articles comprising, a first conveyor means for conveying a stream of articles to be loaded, a plate for receiving articles from said first conveyor, means pivotally mounting said plate at the end of said first conveyor means, a stop to locate on said plate articles from said first conveyor means, means mounting said stop above said plate, a pusher to push articles present on said plate, means mounting said pusher above said plate and on the same side of said stop as said first conveyor means, a second conveyor means beneath said plate for conveying trays to be loaded, and a mechanism coupled to said plate, said stop and said pusher whereby actuation of said mechanism causes said plate to be tipped, said stop to be moved away from said article and said pusher to be moved downwards and away from said first conveyor means to push said article present on said plate down said plate past said stop and off said plate into said tray on said second conveyor means, further actuation of said mechanism causing subsequent return of said plate, said stop and said pusher to their initial positions to enable said plate to receive a further article from said first conveyor means.

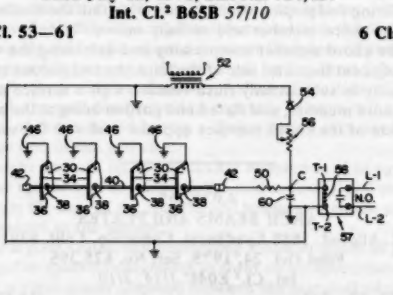
4,030,269
FILLING HEAD DETECTION DEVICE

James W. Mais, East Cleveland, and L. Paul Myers, Munroe Falls, both of Ohio, assignors to A-T-O Inc., Willoughby, Ohio

Filed July 12, 1976, Ser. No. 704,437

Int. Cl.² B65B *57/10*

U.S. Cl. 53—61 **6 Claims**



1. In a case packer including a filling head adapted to have a plurality of rows of abutted articles supplied thereto and

pushed downstream thereof, a filling head detection device comprising

a stop member at the downstream end of each row of articles as supplied to and moved along the filling head,

a conductive metallic flag pivotally carried by each of said stop members and normally projecting slightly in an upstream direction to be struck by an article before it is moved into engagement with a said stop member, each said flag having a hole therein, the stop members and the flags for all of said rows being aligned transversely of said filling head, and

an electrical contact device extending through the holes in said flags, articles moving to the downstream end of the filling head also moving said flags to retracted positions to change their physical and electrical relation with said contact device whereby the operative conditions in an electrical system connecting to said contact device can be varied when all of said flags are moved to retracted positions.

4,030,270

PACK-FORMING APPARATUS

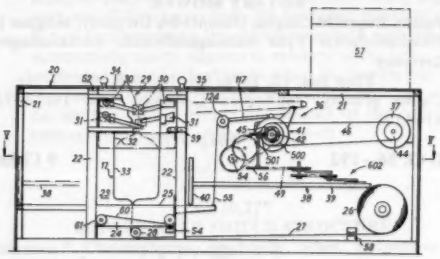
Robert Harry Arnold, London, England, assignor to The Metal Box Company Limited, England

Filed June 27, 1975, Ser. No. 591,005

Claims priority, application United Kingdom, June 29, 1974, 28972/74

Int. Cl.² B65B *5/02, 9/10*

U.S. Cl. 53—183 **19 Claims**



1. In packaging apparatus for forming successive packs of goods in flexible tubular wrapping material, said apparatus comprising: a power unit; pack-forming elements for handling said material in forming said packs; means defining a loading chamber of the apparatus; electrical control means for said pack-forming elements; pack support means in said loading chamber for supporting a succession of lengths of said material at a first end thereof, said packforming elements including holding means in said loading chamber for holding open a second end of each successive length of said wrapping material for goods to be loaded therethrough; the improvement comprising mechanical main drive means including cam means rotatable as a unit; a releasable first clutch coupling said cam means with said power unit; and feed-back means located engageably with respect to, and operable by, said cam means to engage and disengage said first clutch according to the rotational position of said cam means, said electrical control means including first switching means located engageably with respect to, and operable by, said cam means, and means connecting said first switching means electrically in series relationship with each of said electrical control means, whereby actuation of each pack-forming element takes place in a sequence each step of which is dependent at least on the rotational position of the cam means.

4,030,271

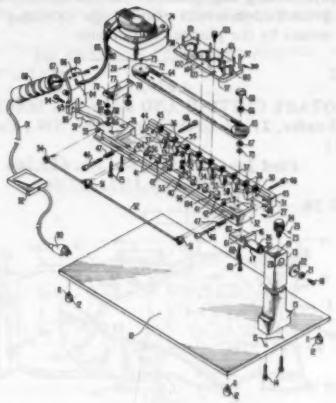
APPARATUS FOR CAPPING AND UNCAPPING CONTAINERS

Bernard C. Kefauver, Frederick, and Norman Little, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed June 11, 1976, Ser. No. 695,171

Int. Cl.² B65B *7/28;* **B67B** *3/20, 7/18*

U.S. Cl. 53—305 **16 Claims**



1. An apparatus for capping and uncapping containers, the apparatus comprising means for storing numbers of caps, means for guiding a plurality of containers into a given geometric relationship to each other in vicinity of said means for storing, an endless belt having oppositely directed spans between which a plurality of the caps are to be positioned, means for bringing said belt into contact with caps which are to be positioned between said spans, and reversible motor means for driving said belt to effect simultaneous rotation of caps between said spans with respect to the plurality of containers selectively to cap or to uncap these containers.

4,030,272

MEANS ON PACKING MACHINE

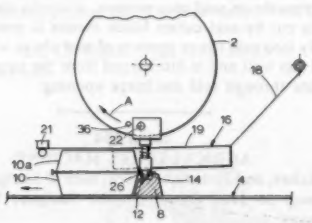
Marius Gundersen, Larvik, Norway, assignor to Vefi A/S, Norway

Filed May 19, 1976, Ser. No. 687,857

Claims priority, application Norway, May 28, 1975, 1890/75

Int. Cl.² B65B *7/26*

U.S. Cl. 53—376 **3 Claims**



1. An apparatus for closing containers with lids provided with complementary press-buttons snap-lock means which operates in connection with a packing machine including a conveyor belt for advancing the containers one after the other therethrough comprising a rotor wheel located above said conveyor belt, compression means located on said rotor wheel

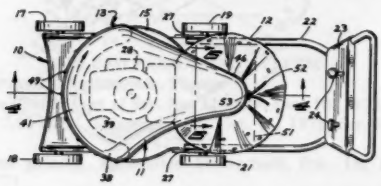
to successively press together and lock said press-button means during the successive passage of the containers on said belt, said compression means being pivotably suspended from said rotor wheel at the circumference thereof whereby said compression means will undergo angular pivotal movement to facilitate accommodation relative to the press-button means on the container due to the action of gravity, said compression means including a plunger rod means dimensioned to fit into the press-button means, said rod means being surrounded by a tube-like socket whereby the front surface of said socket comes into biasing engagement with the container surrounding the press-button means prior to the locking of the press-button means by the plunger rod means.

4,030,273

ROTARY CUTTING AND BAGGING MACHINE

Victor Leader, 21324 Lake George Drive NW., Cedar, Minn. 55011

Filed Jan. 28, 1976, Ser. No. 653,264
Int. Cl.² A01D *35/22, 53/06*
U.S. Cl. 56—13.4 **8 Claims**



1. A rotary mower and bagging chute for cutting grass and discharging the cut grass into a collection receptacle comprising a rotary mower having a housing, said housing including a top wall having front and rear portions and a continuous downwardly directed imperforate side wall extending entirely around the periphery of said top wall, motor means mounted generally centrally of said top wall and having a drive shaft extending therethrough, cutter blade means fixed to said drive shaft within said housing, said cutter blade means having lift portions for causing air and cut grass to move vertically upwardly, said front portion of said top wall having an arcuate opening substantially in alignment with said lift portions of said cutter blade means and symmetrical about the longitudinal axis of said housing, a hollow chute fixed to said top wall and extending substantially vertically upward therefrom, the lower portion of said chute having an arcuate cross-section generally complementary to the arcuate opening in said top wall, the arcuate lower portion of said chute partially surrounding said motor means, and the upper portion of said chute extending rearwardly over said motor means and communicating with a discharge opening located above said rear portion of said top wall for discharging cut grass into a collection receptacle on said rear portion, whereby the grass which has been cut by said cutter blade means is moved vertically upwardly into said lower portion of said chute without engaging said top wall and is discharged from the upper portion of said chute through said discharge opening.

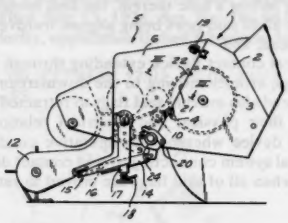
4,030,274

AGRICULTURAL MACHINE

Erwin Reber, and Fritz Schöllhorn, both of Saulgau, Germany, assignors to Josef Bautz GmbH, Saulgau, Wurttemberg, Germany

Filed Mar. 12, 1975, Ser. No. 557,668
Claims priority, application Germany, Mar. 15, 1974, 2412461
Int. Cl.² A01D *43/00*
U.S. Cl. 56—13.5 **8 Claims**

1. In an agricultural machine for picking up and chopping stalks and other materials, a combination comprising a first unit including a first housing having a leading end portion and a trailing end portion provided with a rearwardly facing open end, material pick-up means, and conveyor means in said first housing for receiving material from said pick-up means and conveying it to said open end; a second unit including a crop-receiving second housing having an open front end facing said open end of said first unit so as to receive the fed material therethrough, a rotary cutter head and a cooperating station-



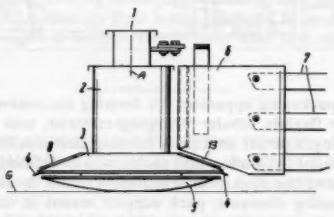
ary cutter bar in said second housing for chopping the material entering from said first housing; and quick-release coupling means for removably connecting said units to one another with said open ends in mutually facing relationship so that, upon disengagement of said units from one another, the components located in the interiors of said housing become accessible through the respective open ends thereof.

4,030,275

ROTARY MOWER

Hermann Ruprecht, Singen, Hohentwiel, Germany, assignor to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany

Filed Jan. 12, 1976, Ser. No. 648,099
Claims priority, application Germany, Jan. 16, 1975, 2501642
Int. Cl.² A01D *57/30*
U.S. Cl. 56—192 **9 Claims**



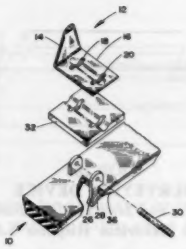
1. A rotary mower comprising:
a support displaceable along the ground;
a drum suspended from said support and rotatable relative thereto about an upright axis in a rotation sense;
a downwardly flared skirt on said drum;
a deflector plate secured to said support and having a lower edge spaced above and extending generally parallel to said skirt;
a ridge on said skirt displaceable on rotation of said drum underneath said lower edge, said ridge having a leading edge sweeping past said plate on rotation of said drum and juxtaposable with said lower edge, said edges including an acute angle between them upon juxtaposition of said edges; and
at least one blade secured to said skirt and extending generally radially therefrom.

4,030,276

INTEGRALLY MOLDED BELT WITH WORKING ELEMENT ATTACHED THERETO

Alfred L. Stecklein, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed June 8, 1973, Ser. No. 368,424
Int. Cl.[2] A01D *55/24*
U.S. Cl. 56—291 8 Claims



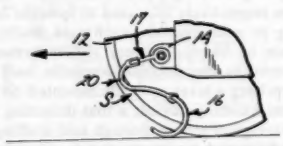
1. A power transmission belt adapted to perform work in addition to power transmission comprising:
at least two V-belts of substantially the same circumference and section arranged and spaced side-by-side in transverse alignment, the belts attached together with an integral tie-band at a radially outer surface of each V-belt to define an integral carrier belt;
at least one operative element disposed exteriorly of the carrier belt, the element having at least two spaced attaching portions oriented transversely of the carrier belt;
fastening means for attaching the operative element in at least two places to at least two V-belt transversely aligned portions of the carrier belt, the fastening means of each V-belt in substantially lineal alignment with each other at substantially ninety degrees in relation to the belt;
whereby the spaced attaching portions in cooperation with the fastening means enhances torsional rigidity of the carrier belt and stabilizes movements of the operative element transversely of the carrier belt.

4,030,277

MOWER REAR SHIELD STRUCTURE

Herman P. Christopherson, Burnsville, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed July 3, 1974, Ser. No. 485,379
Int. Cl.[2] A01D *75/20*
U.S. Cl. 56—320.1 10 Claims



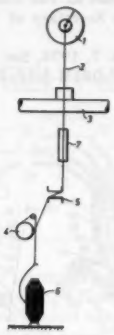
1. A rear shield for a power mower comprising, in combination:
a strip of flexible material;
means extending along one edge of the strip for supporting it behind a mower;
and means including a downwardly convex rigid strip of substantially hemi-cylindrical cross section extending along the other edge of said strip for rendering said edge substantially less flexible;
the total width of said strip and the first and second named means being such that when the shield is mounted on the mower the last named means is in contact with the surface being mowed.

4,030,278

HIGHLY ELASTIC CRIMP YARN

Karl-August Heinroth; Theo Dietrich; Hans Bach, and Hans-Dieter Jurischka, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 187,702, Oct. 8, 1971, abandoned.
This application Jan. 13, 1975, Ser. No. 540,728
Claims priority, application Germany, Oct. 8, 1970, 2049357
Int. Cl.[2] D01H *7/92*; D02G *1/00*
U.S. Cl. 57—34 HS 2 Claims



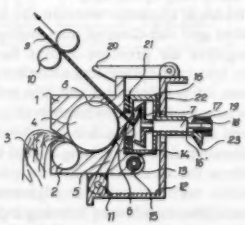
1. An apparatus for the production of a highly elastic crimped yarn by stretch texturising using the false-twist method and setting a synthetic endless filament comprising a supply unit of a stretch-texturising machine, a drafting roller, an internal friction twist-imparting unit and a contact heating rail, the spacing between the twisting unit and the heating rail being between 150 and 30 mm, the heating rail having a roughened contact surface and a length of at most 400 mm and means for separately controlling the speed of the drafting roller and the twist imparting unit being separately controllable.

4,030,279

HIGH-SPEED SPINDLE HOLDER SUSPENSION FOR OPEN-END SPINNING MACHINES

Miroslav Rambousek; Ladislav Kapl, and Milos Mladek, all of Usti nad Orlice, Czechoslovakia, assignors to Elitex, Zavody textilniho strojirenstvi, generalni reditalstvi, Liberec, Czechoslovakia

Filed Dec. 1, 1975, Ser. No. 636,433
Claims priority, application Czechoslovakia, Nov. 29, 1974, 8171/74
Int. Cl[2] D01H *1/12, 7/00, 13/26*
U.S. Cl. 57—58.89 5 Claims



1. In a high-speed open-end spinning machine having a body

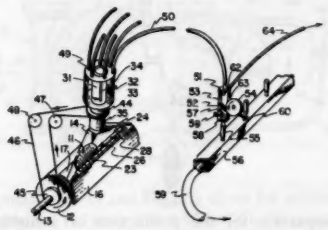
upon which there is pivotally mounted a holder for a high-speed spindle, the improved pivotal mounting means which comprises a sleeve and a pivot pin extending into the sleeve, the sleeve bieng connected to one of the body and the holder, and the pivot pin being conncted to the other of the body and the holder, and a resilient damping element disposed between the contact surfaces of the sleeve and pin and having a flange which separates the front contact surfaces of the sleeve and the holder.

4,030,280

FIBER BLENDING, SUBDIVIDING, AND DISTRIBUTING SYSTEM

Craig L. Folk, New Orleans, and James I. Kotter, Mandeville, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 7, 1976, Ser. No. 647,244
Int. Cl.² D01H *1/12*; D01G *23/08*
U.S. Cl. 57—58.95 **37 Claims**



1. An apparatus for removing textile fibers from a single source, transporting, collecting, blending, subdividing, and distributing said fibers in equal amounts to multiple remote locations, whereby said fibers are continuously assembled into uniform ribbons for subsequent textile processing or supplied directly to open-end spinning units comprising in combination:

a. a fiber feeding means comprising:
   1. a cylinder supported and driven by a shaft,
   2. a pneumatic system drawing air from the atmosphere across the circumference or pheriphery of said cylinder by means of
      A. a vacuum suction, said fiber feeding means discharging into

b. a collecting means comprising a transitional duct encompassing a rectangular to round cross-section with multiple internal baffles, said baffles serving as a means of maintaining equal air velocity gradient across the transitional duct to equally disperse fibers through a round fiber outlet, said round outlet also serving as a journal and pneumatic seal for

c. a fiber distribution means comprising:
   1. a rotating fiber entrance tube, longitudinally slotted and disbursing fibers into
   2. a cylindrical chamber wherein the fibers are intimately blended and sub-divided into multiple outlets
   3. a negative air pressure means for transporting said fibers into said cylindrical chamber,

d. a means of transporting the fibers from the multiple outlets to a multiplicity/plurality of condensing units or open-end spinners comprising a plurality of tubes,

e. a condensing unit comprising a grid surface to separate fibers from the airstream and

f. a rotatable take-out cylinder adjacent to and in contact with each fiber condenser forming a pneumatic seal, and in close proximity to the grid surface within the condenser, rotating at a low speed, thereby withdrawing fibers from the confines of said condenser resulting in a continuous forming of a fiber ribbon, at a determined production rate,

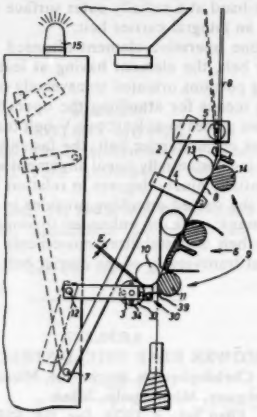
g. a curved deflection plate in close proximity to the rotating take-out cylinder serving as a guide for feeding the newly formed fibrous ribbon to a subsequent process.

4,030,281

SURVEYING DEVICE

Alf Schopper, Meyrin, and Jean Linder, Genf, both of Switzerland, assignors to Heberlein Hispano S.A., Vernier-Genf, Switzerland

Filed Aug. 19, 1975, Ser. No. 605,937
Claims priority, application Switzerland, Sept. 3, 1974, 11986/74
Int. Cl.² D01H *13/18*, *13/26*
U.S. Cl. 57—87 **6 Claims**



1. Surveying apparatus on an automatic knotting device movable along a spindle row in a texile machine including drafting devices respectively allocated to spindles for drafting rovings passing to said spindles, each said drafting devices including a pair of output delivery rollers between which roving is delivered to the associated spindle, said surveying apparatus comprising a lever pivotally mounted on the casing of the automatic knotting device, a first detecting device for checking the passage of roving through said drafting device, a device for pinching and interrupting the roving feed to said drafting devices, said first detecting device and said pinching and interrupting device being mounted on said lever, said lever being pivotable into and away from positions in which said first detecting device and said pinching and interrupting device are operatively related to the roving fed to and passing through said drafting devices, a member movably mounted on the casing of the automatic knotting device, a second detecting device for detecting the wrapping or roving around either one of said output delivery rollers, said second detecting device being mounted on said member and said member being movable into and away from a position in which said second detecting device is operatively related to said output delivery rollers.

4,030,282

RESILIENT SUPPORT FOR SPINNING-RING OR TWISTING-RING BEARING

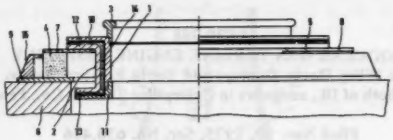
Alfons Spies, Munich, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed July 24, 1975, Ser. No. 598,790

Claims priority, application Germany, July 25, 1974, 2435771

Int. Cl.² D01H 7/56, 7/64

U.S. Cl. 57—124 6 Claims



1. In an air bearing for a spinning or twisting ring and including a spinning stand, a stator, and a rotor, the improvement comprising

an absorber-damper support system for resiliently supporting the stator on said stand, an including two oppositely disposed and spaced apart ring segments composed of resilient material, each said ring segment being disposed between and secured with relation to said stator and said stand thereby to support said stator with respect to said stand, with a resiliency which varies circumferentially around said support system.

4,030,283

ELECTRICALLY DRIVEN TIME PIECE WITH MEANS FOR EFFECTING A PRECISE SETTING OF TIME

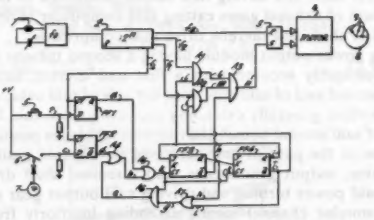
Pierre A. Sauthier, Bruegg, and Cyril Vuilleumier, Bienne, both of Switzerland, assignors to Societe Suisse Pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Mar. 24, 1975, Ser. No. 561,344

Claims priority, application United Kingdom, Mar. 25, 1974, 13090/74

Int. Cl.² G04C 3/00

U.S. Cl. 58—23 R 10 Claims



1. An electrically driven timepiece comprising:

time display means including a seconds display means;

a source of timing pulses;

frequency divider means responsive to said timing pulses for producing display advancing pulses;

logic circuit means responsive to said display advancing pulses for controlling application of said display advancing pulses to said seconds display means;

a modulo-three counter having a first stable state for selectively controlling said logic circuit means to apply said display advancing pulses to said seconds display means at a first normal rate, a second stable state for controlling said logic circuit means to apply pulses to said seconds display means at a second faster than normal rate, and a third stable state controlling said logic circuit means to block said display advancing pulses altogether; and,

switch means actuable by the user of said timepiece, for advancing said counter in sequence from said first stable state to second to said third and back to said first stable state.

4,030,284

CONTROL DEVICE FOR AN ELECTRONIC WRIST WATCH

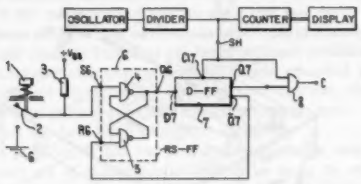
Hubert Portmann, Colombier, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Nov. 25, 1975, Ser. No. 635,088

Claims priority, application Switzerland, Dec. 11, 1974, 16371/74

Int. Cl.² G04C 3/00

U.S. Cl. 58—23 R 4 Claims



1. A control device of an electronic time-piece, comprising a push-button switch for providing a control signal, a memory element for memorizing said control signal, a delay means, a clock signal line, and a logic gate having inputs connected to an output of said delay means and to said clock signal line only, an input of said delay means being connected to said clock signal line, information from said memory element being transmitted in synchronism with a clock signal from said clock signal line through said delay means and said logic gate, the said information transmitted by the delay means erasing the contents of said memory element when the control signal has ceased.

4,030,285

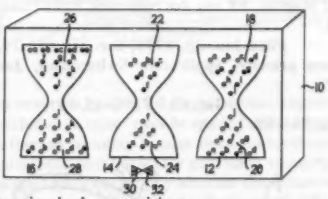
ELECTRONIC HOUR GLASS CLOCK

Harshadrai D. Sheth, 32522 Jaclynn Drive, Union City, Calif. 94587

Filed Jan. 2, 1976, Ser. No. 646,150

Int. Cl.² G04C 3/00; G04B 19/06

U.S. Cl. 58—50 R 22 Claims



1. An electronic clock comprising;

a display having first and second display areas, each of said areas having a plurality of display elements, switchable between first and second display states in response to supplied control signals, each of said elements in said first display area being associated with a corresponding element in said second display area; and

electronic control means for providing a sequence of said control signals to said display, to cause successive ones of said element in said first display area to be changed from said first to said second display state at selected time

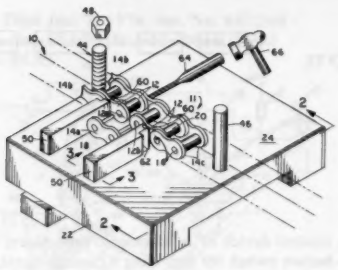
intervals, and to simultaneously cause the element corresponding thereto in said second display area to be changed from said second to said first display state and for additionally providing reset signals to cause selected elements in said first area to be in said first display state and selected elements in said second area to be in said second display state after a time period comprising a selected number of said time intervals.

4,030,286

LINK DRIVE CHAIN REPAIR TOOL

Frank Gibilaro, 55 Ferndale Court, Copiague, Long Island, N.Y. 11726

Filed July 19, 1976, Ser. No. 706,269
Int. Cl.² B21L *21/00*
U.S. Cl. 59—7 **6 Claims**



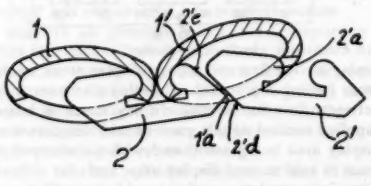
1. A link drive chain repair tool comprising in combination:
a base plate having upper and lower faces;
a pair of longitudinally aligned stud elements mounted on said base plate and projecting upwardly from the upper face thereof;
a pair of link support members mounted on said upper face of said base plate intermediate said stud elements to one side thereof and extending in spaced parallel relation to each other so as to provide lateral bearing support for an adjacent pair of inner chain links during removal and replacement of an outer link connecting said inner links;
and clamping means depending from said base plate adapted to clamp said tool to a portion of a machine driven by the link drive chain which underlies the drive chain.

4,030,287

ARTICULATED BRACELET

Roland Magnin, 32, rue des Noirettes, 1227 Carouge, Switzerland

Filed Jan. 23, 1976, Ser. No. 651,793
Claims priority, application Switzerland, Jan. 27, 1975, 936/75
Int. Cl.² F16G *15/04*
U.S. Cl. 59—85 **4 Claims**



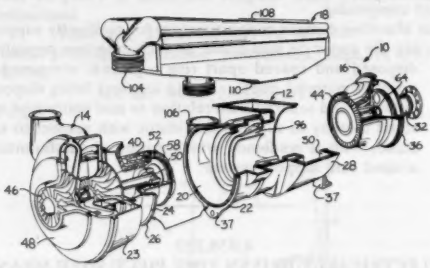
1. A bracelet, comprising:
a chain of outer, tubular links of oval cross-section, each outer link having an outer face, normally visible, exposed when the bracelet is worn, and an inner face, defining an opening; and
pairs of inner links, each having mutually facing, rounded, terminal hook portions for pivotal action against mutually adjacent rounded inner surfaces of said outer links, each inner link having its terminal hook portions extending into the openings of a pair of mutually adjacent ones of the outer links, to normally interconnect the outer links by the inner links.

4,030,288

MODULAR GAS TURBINE ENGINE ASSEMBLY

Warren Wiley Davis, Dunlap, and David Edward Keedy, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 10, 1975, Ser. No. 630,476
Int. Cl.² F02C *3/10, 7/20*
U.S. Cl. 60—39.16 R **25 Claims**

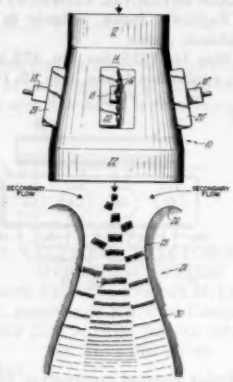


1. A modular gas turbine engine assembly, comprising:
1. a tubular case;
2. a gasifier module having a first tubular housing releasably secured with a first end thereof adjacent a first end of said case with the axis of said first housing aligned generally with the axis of said case, a compressor generally within a second end of said first housing, a combustor generally extending outwardly from said first end of said first housing, and a first shaft extending from said compressor to adjacent said combustor;
3. a gasifier turbine extending outwardly radially from said first shaft and having first blades positioned to be in the path of exhaust gases exiting said combustor to drive said first shaft and thereby drive said compressor;
4. a power output module having a second tubular housing releasably secured with a first end thereof adjacent a second end of said case with the axis of said case, a power turbine generally extending outwardly from said first end of said second housing having second blades positioned to be in the path of exhaust gases exiting said gasifier turbine, output gear means, and a second shaft driven by said power turbine and driving said output gear means;
5. annular channel means extending interiorly from said case intermediate said first and second extending means for directing said exhaust gases from said first blades to said second blades;
6. first flange means attached to the interior of said case and extending inwardly within said case generally towards said combustor;
7. second flange means attached to the interior of said case and extending inwardly within said case generally towards said power turbine;
8. first slidable sealing means for slidably adjustably sealing said gasifier module adjacent said combustor to said first extending means; and
9. second slidable sealing means for sealing said power output module adjacent said power turbine to said second extending means.

4,030,289
THRUST AUGMENTATION TECHNIQUE AND APPARATUS

Robert F. Kampe, West Hartford, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed Oct. 29, 1973, Ser. No. 410,606
Int. Cl.² F23R *1/00*
U.S. Cl. 60—204 **7 Claims**

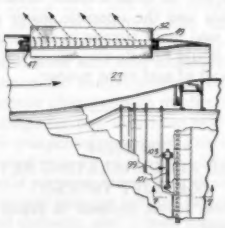


1. A method of thrust augmentation comprising the steps of:
generating a stream of primary gas, said stream having a normal flow axis;
varying the angular direction flow of the primary gas stream with respect to its normal axis at a sufficiently rapid rate to interrupt the stream to produce gas pulses traveling in different angular directions in a predetermined sequence; and
directing the gas pulses to an eductor, rarefraction of ambient air behind each pulse and compression of the ambient air past the eductor.

4,030,290
JET ENGINE THRUST REVERSER

Claude R. Stachowiak, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 6, 1974, Ser. No. 521,264
Int. Cl.² F02K *3/02*
U.S. Cl. 60—226 A **15 Claims**

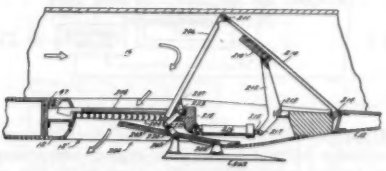


1. A thrust reverser for a jet engine comprising a nacelle and a turbine, said nacelle surrounding said turbine in a manner such that an air duct is located aft of the turbine, said thrust reverser comprising:
1. a cascade section including:
a. a plurality of elongated cascade elements mounted in the nacelle of said jet engine aft of said turbine so as to be rotatably movable about spaced, generally parallel longitudinal axes that lie generally parallel to the longitudinal axis of said jet engine between a closed position whereat said cascade elements form a portion of the outer wall of said nacelle and a portion of the outer wall of the aft air duct of said jet engine and an open position whereat said cascade elements form a passageway between said aft air duct and the exterior of said nacelle, each of said cascade elements including a plurality of spaced, curved vanes lying along their respective longitudinal axes and positioned so as to direct air from said aft air duct generally toward the air intake end of said jet engine when said cascade elements are in their open position, said plurality of cascade elements each further including inner and outer panels affixed to and mounted on opposed edges of said spaced, curved vanes such that said plurality of spaced, curved vanes and said inner and outer panels rotate together as said cascade elements rotate about said spaced, generally parallel longitudinal axes, said inner and outer panels positioned such that said inner panels form said portion of the outer wall of said air duct and said outer panels form said portion of the outer wall of said nacelle when said cascade elements are in their closed positions; and
b. cascade element movement means attached to said cascade elements for moving said cascade elements between their open and closed positions; and,
2. an aft air duct blocker section including:
a. A plurality of blocker elements mounted in said aft air duct aft of said cascade section so as to be movable between a closed position whereat said blocker elements form a door adapted to block said aft air duct and an open position whereat said blocker elements are retracted to a position which allows air to flow through said aft air duct in a normal manner; and,
b. duct blocker movement means connected to said plurality of blocker elements for moving said plurality of blocker elements between their closed and open positions.

4,030,291
THRUST REVERSER FOR A GAS TURBOFAN ENGINE

Donald Farley Sargisson, Cincinnati, Ohio, assignor to General Electric Company, Lynn, Mass.

Filed Jan. 2, 1976, Ser. No. 646,074
Int. Cl.² F02C *3/06*; **F02K** *3/06*, *1/20*
U.S. Cl. 60—226 A **1 Claim**



1. A thrust reverser system for a gas turbine engine of the type which includes an outer nacelle spaced apart from a core engine to define an annular bypass duct therebetween and having a fan disposed in the inlet for providing compressed air to the bypass duct and core engine wherein the thrust reverser system is incorporated into the nacelle immediately downstream of the fan and includes a plurality of circumferentially spaced thrust reversers each comprising:
a passageway through the nacelle having a plurality of turning vanes disposed therein;
an outer door translatably mounted to the nacelle and movable between an open position wherein the passageway is uncovered and a closed position wherein the passageway is covered and including a plurality of rollers which slidingly engage a beam track diagonally spanning the turning vanes;

a blocker door disposed to be movable between an open position wherein the bypass duct flow is obtruded by the blocker door at a point downstream of the passageway and a closed position wherein the bypass duct flow is unobtruded by the blocker door, said blocker door including a roller at its upstream end which slidingly engages a second track spaced radially inward from and spanning the turning vanes and having its upstream end also joined to one of the outer door rollers by a pair of pivotally connected links;

a support door having its upstream end hinged to the downstream end of the blocker door, its downstream end hinged to the nacelle at a point downstream of the turning vanes, and

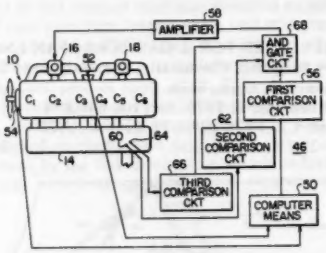
linear actuator means for simultaneously moving the outer door and blocker door between their respective open and closed positions, comprising a bell crank lever having its upstream end mounted in sliding engagement with a track disposed on the support door, hinged downstream of its midspan to the outer nacelle at a point upstream of the downstream end of the support door and having its downstream end pivotally mounted to the actuating arm of a linear actuator, whereby linear movement of the actuating arms in the upstream direction causes the blocker door to translate downstream along the second track while rotating radially inward and the outer door to simultaneously translate downstream along the beam track.

4,030,292

METHOD AND APPARATUS OF CONTROLLING AN AIR FUEL MIXTURE FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Kenji Masaki, No. 30-8, Nagahama, Kanazawa, Yokohama, and Hidehiro Minami, No. 18, Nojima-cho, Kanazawa, Yokohama, both of Japan

Filed June 11, 1975, Ser. No. 585,828
Claims priority, application Japan, June 13, 1974, 49-67464
Int. Cl.² F02B *75/10*
U.S. Cl. 60—274 **11 Claims**



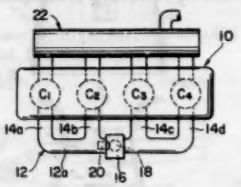
1. An apparatus for controlling an air-fuel mixture for a multi-cylinder internal combustion engine, comprising first mixture feeding means for feeding a relatively rich air-fuel mixture having an air-fuel ratio lower than a predetermined air-fuel ratio and a relatively lean air-fuel mixture having an air-fuel ratio higher than said predetermined air-fuel ratio to a first cylinder of a multi-cylinder internal combustion engine, second mixture feeding means for feeding a relatively lean air-fuel mixture having said air-fuel ratio higher than said predetermined air-fuel ratio to a second cylinder of said engine during operation of said engine, and control means for controlling said first mixture feeding means in accordance with an operating parameter of said engine to feed said relatively rich air-fuel mixture during a first operation of said engine when an exhaust gas treating device of said engine is inactive to oxidize burnable harmful components in the exhaust gas discharged from said engine and to feed said relatively lean air-fuel mixture during a second operation of said engine when said exhaust gas treating device is active to oxidize said burnable harmful components, in which said first and second mixture feeding means comprise first and second carburetors, respectively, said first carburetor comprising mixture enriching means operative to enrich a fuel mixture fed by said first carburetor from said relatively lean air-fuel mixture to said relatively rich air-fuel mixture, said control means rendering said mixture enriching means inoperative in response to an engine load in excess of low load.

4,030,293

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Yoshitaka Hata, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 16, 1975, Ser. No. 578,152
Claims priority, application Japan, May 20, 1974, 49-56850
Int. Cl.² F02B *75/10*
U.S. Cl. 60—285 **8 Claims**



1. A multi-cylinder internal combustion engine having a first group of cylinders consisting of at least half the total number of cylinders and a second group of cylinders consisting of the remaining cylinders, the engine comprising:

a carburetor for supplying an air-fuel mixture into all the cylinders;

an intake manifold including an elongate main runner, a first group of branch runners connected to said main runner and communicable with the first group of cylinders, a second group of branch runners connected to said main runner and communicable with the second group of cylinders, and a manifold riser connected to the central portion of said main runner and communicated with said carburetor;

means for obstructing the stream of a portion of liquid fuel flowing along the inner wall of said main runner toward the first group of cylinders, the liquid fuel being separated from the air-fuel mixture, said means including a fence plate disposed within a portion of said main runner between said manifold riser and one of the first group of branch runners, most adjacent said manifold riser, said fence plate being disposed at the upper portion of the inner wall of said main runner to which said manifold riser is connected, to form a space between the end of said fence plate and the opposite lower portion of the inner wall of said main runner in order to obstruct the stream of the liquid fuel flowing along the upper portion of the inner wall of said main runner.

4,030,294

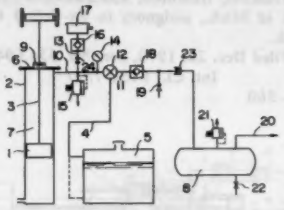
COMPRESSED AIR GENERATING DEVICE FOR FORKLIFT TRUCKS

Teisuke Ishida, Mito, Japan, assignor to Japan Patent Center Inc., Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 669,916
Int. Cl.² F15B *11/06*
U.S. Cl. 60—407 **1 Claim**

1. In a compressed air generating device for forklift trucks, the improvement in which a main pipeline connected to an end of a lift cylinder air chamber brances into a high-pressure air pipe and a return pipe, selectively communicating with the main pipeline through a switching valve means, and when the main pipeline switches to communication with the high-pres-

sure air pipe, during a descending phase of a piston in the lift cylinder, air is sucked through an air suction pipe attached to



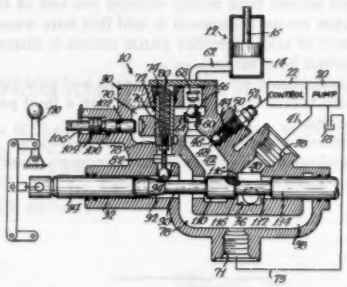
the main pipeline into the lift cylinder air chamber, and during a rising phase of the piston, the air in the air chamber is compressed and is sent into an air tank as compressed air.

4,030,295

CONTROL VALVE FOR TRACTOR-IMPLEMENT HYDRAULIC SYSTEM

Ramkishan Khatti, Racine, and Patrick M. Lourigan, Kenosha, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed June 3, 1976, Ser. No. 692,293
Int. Cl.² F16H *39/46*
U.S. Cl. 60—445 **4 Claims**



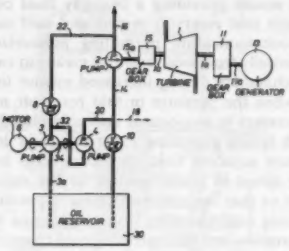
1. In a tractor-implement hydraulic system having a valve interposed between a one-way implement-actuating assembly including a cylinder and piston, a reservoir and a variable displacement pressure compensated pump having pressure compensating means, said valve including a valve housing having a valve bore with a valve spool slidable in said bore, an inlet chamber in communication with said pump and said bore, a pressure chamber in communication with said bore at a location spaced from said inlet chamber, a first passage in said housing connected to said pressure compensating means and to said pressure chamber with unidirectional valve means in said first passage limiting flow from said pressure chamber to said pressure compensating means, a second passage in said housing connected to one end of said cylinder and in communication with said pressure chamber with unidirectional valve means in said second passage limiting flow from said pressure chamber to said cylinder, and a third passage in said housing connected to said one end of said cylinder and said reservoir, said third passage having means therein normally blocking flow through said passage, so that movement of said valve spool in one direction from a neutral position will interconnect said chambers to pressurize said pressure chamber and open both unidirectional valve means and movement of said valve spool in an opposite direction from said neutral position will open said third passage to connect said cylinder to said reservoir.

4,030,296

HYDRAULIC DEVICE FOR ROTATING A TURBINE

Hans Deinlein-Kalb, Nurnberg, Germany, assignor to AEG-Kanis Turbinenfabrik GmbH, Germany

Filed Apr. 8, 1976, Ser. No. 674,909
Claims priority, application Germany, Apr. 18, 1975, 2517187; Mar. 11, 1976, 7512424[U]
Int. Cl.² F15B *13/09*
U.S. Cl. 60—486 **3 Claims**



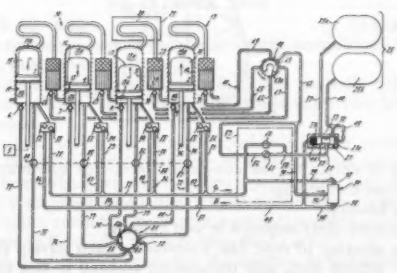
1. A device for rotating a turbine, particularly during starting, comprising a positive displacement-type main oil pump having a main oil pump suction, and having a shaft connected to the turbine and normally driven by the turbine, an auxiliary oil pump, a high-pressure oil pump having a discharge which is adapted to be connected for supplying bearing oil pressure and which is connected to said suction of said main oil pump, said auxiliary oil pump being mechanically coupled to said high-pressure oil pump and being hydraulically connected in series to said high-pressure oil pump, said high-pressure pump being connected to discharge to said main oil pressure pump suction to drive said main oil pressure pump as a motor when the speed of the turbine is low enough so that the main oil pressure pump does not deliver a quantity of oil sufficient to prevent a buildup of pressure in the suction of said main oil pressure pump.

4,030,297

HYDROGEN COMPRESSION SYSTEM FOR STIRLING ENGINE POWER CONTROL

Don B. Kantz, Ferndale, and Tim F. Lezotte, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 28, 1976, Ser. No. 700,678
Int. Cl.² F02G *1/06*
U.S. Cl. 60—521 **7 Claims**



1. For use in a regenerative Stirling engine employing a plurality of double-acting pistons, each operating within a cylinder to define therein hot and cold chambers on opposed sides of each of said pistons, an apparatus for controlling the power of said engine, comprising:

a. reservoir means regulated to maintain a predetermined pressure therein and being connected to said closed pressurized gas system,

b. first means providing a reversible fluid communication for each one of said cold chambers and one of the next most adjacent hot chambers in series,

c. second means providing a one-way fluid communication between each of said cold chambers and said reservoir means, said communication permitting pressurized fluid flow from said cold chambers to said reservoir during steady state or reduced engine torque demand and when the pressure in any one of said cold chambers exceeds the pressure in said reservoir means,

d. third means providing a one-way fluid communication between said reservoir means and said cold chambers, said communication permitting pressurized fluid flow sequentially from said reservoir means to each one of said cold chambers during increased engine torque demand and when the pressure in said reservoir means exceeds the pressure in any one of said cold chambers, and

e. fourth means providing a one-way fluid communication between adjacent cold chambers, said communication being timed in phase relation to the operation of said piston so that the communication is permitted when the egressing cold chamber is undergoing or has completed compression and the ingressing cold chamber is preparing to undergo compression whereby fluid in said cold chambers is subjected to a staged pumping effect for increasing the mean pressure therein.

4,030,298

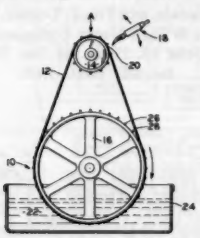
THERMAL MOTOR

Dante J. Sandoval, 6412 Pear Ave., Cleveland, Ohio 44102

Division of Ser. No. 527,254, Dec. 13, 1974. This application Feb. 19, 1976, Ser. No. 659,338

Int. Cl.² F03G 7/06

U.S. Cl. 60—527 **9 Claims**



1. A device for the conversion of energy into mechanical motion comprising:

a housing;

a drive shaft mounted in said housing;

a plurality of reed like transducers each having first and second ends, said transducers adapted to flex upon the application of stimulus, said transducers being rigidly attached in radial alignment to said drive shaft at said first ends and drivingly engaging said housing at said second ends, wherein stimulation of at least one of said transducers causes clockwise movement of said drive shaft, and stimulation of at least another of said transducers causes counterclockwise movement of said drive shaft; and,

means to apply stimulus first to at least one of said transducers, to cause reciprocating motion of said drive shaft.

4,030,299

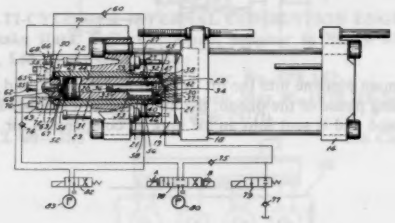
INTENSIFIED CYLINDER ASSEMBLY

Donald L. Reuschel, Hamilton, and James W. Hendry, Holland, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Dec. 20, 1974, Ser. No. 534,604

Int. Cl.² F15B 7/00

U.S. Cl. 60—560 **9 Claims**



1. A ram and pressure intensifier device comprising,

a. a hydraulic cylinder means having a ram piston means disposed therein with said cylinder means connected to a fluid pressure switching means,

b. said ram piston means having a first and second bore means extending therethrough wherein said second bore means is vented to tank means from juncture of said first and second bore means by a passage means;

c. an intensifier piston means disposed in said (ram piston) first and second bore means wherein rod end of intensifier piston means is disposed in said first bore means and head end of said intensifier piston means is disposed in said second bore means;

d. head end of said second bore means and said pressure switching means in communication with a fluid pressure means; and

e. said intensifier piston means slideable in said ram piston means wherein said first bore means communicates with cylinder chamber means.

4,030,300

POWER GENERATING SYSTEM

William C. Thompson, P.O. Box 271, Desert Hot Springs, Calif. 92240

Continuation-in-part of Ser. No. 549,352, Feb. 12, 1975, abandoned. This application Aug. 10, 1976, Ser. No. 713,112

Int. Cl.² F03G 3/04

U.S. Cl. 60—639 **21 Claims**

1. A gravity flow power generating system, comprising:

means for supplying solid material for gravity flow from a predetermined upper level;

a first wheel mounted for rotation on a substantially horizontal axis below said upper level for receiving said material flowing from said means;

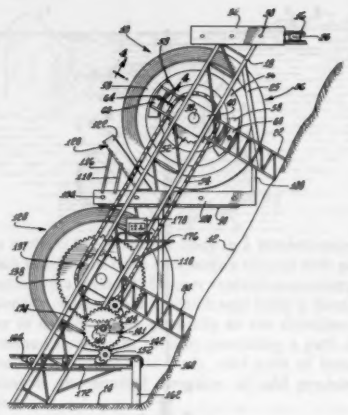
peripheral pockets in said first wheel being open to the periphery thereof for carrying said material,

said material in said first wheel providing weight adjacent the periphery thereof to cause it to rotate,

said pockets when rotated to a predetermined lower level adapted to gravity discharge said material; and

material receiving means closely adjacent said first wheel to receive said material therefrom and to be driven by the rotation thereof,

said material receiving means being adapted to gravity discharge said material.

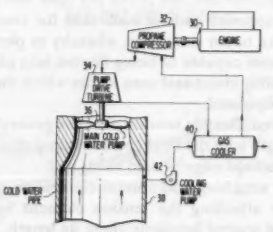


4,030,301

PUMP STARTING SYSTEM FOR SEA THERMAL POWER PLANT

James H. Anderson, York, Pa., assignor to Sea Solar Power, Inc., York, Pa.

Filed June 24, 1976, Ser. No. 699,245
Int. Cl.² F03G 7/04; F01K 23/06
U.S. Cl. 60—641 2 Claims



1. In a power generating plant of the gaseous fluid turbine powered type for operation on or near the surface of an ocean and which uses ocean surface water as a source of heat for the boiler and cold water pumped from substantial depths to absorb heat from the working fluid, an auxiliary drive for the water pumps for starting up and other times when the main system is not operating comprising:

a gas turbine connected to drive at least one of the pumps;

a prime mover;

a compressor connected to be driven by said prime mover;

a gas cooler;

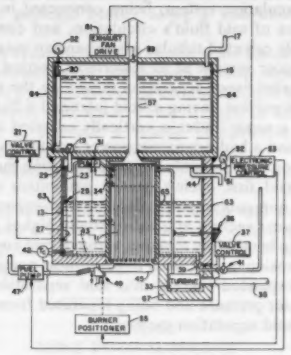
means connecting said compressor, said turbine and said gas cooler in a closed fluid loop so that high pressure gas from said compressor supplies motive fluid to said gas turbine, the exhaust gas of said gas turbine being connected to said cooler and back to the suction side of said compressor:

4,030,302

STEAM POWER PLANT

Peter Mankouski, 90-16 54th Ave., Elmhurst, N.Y. 11373

Continuation-in-part of Ser. No. 596,601, July 17, 1975, abandoned. This application Apr. 6, 1976, Ser. No. 674,164
Int. Cl.² F01K 7/38; F22D 1/32
U.S. Cl. 60—667 8 Claims



1. A steam engine comprising a boiler for converting water to steam, a feedwater tank, means for pumping water from said feedwater tank to said boiler, a steam driven prime mover connected to receive and be driven by the steam generated in said boiler, valve means operable in a first condition to direct exhaust steam from said prime mover directly into the water in said feedwater tank at the bottom thereof and operable in a second condition to dump the exhaust steam from said prime mover externally of said feedwater tank, and means responsive to the temperature in said feedwater tank to control said valve means switching said valve means to said first condition whenever the temperature in said feedwater tank falls below a first predetermined temperature and switching said valve means to said second condition whenever the temperature in said feedwater tank rises above a second predetermined temperature greater than said first predetermined temperature.

4,030,303

WASTE HEAT REGENERATING SYSTEM

Robert A. Kraus, and Edmund J. Kraus, both of 14160 Redhill, Tustin, Calif. 92680

Filed Oct. 14, 1975, Ser. No. 622,266
Int. Cl.² F01K 25/04
U.S. Cl. 60—688 12 Claims

1. A power-producing heat engine system, comprising a first closed, heat vapor power cycle;

incorporating a vertical-oriented, closed, partially heated and partially cooled, condensible fluid-vapor circulating system;

being connected in the proper sequence with the working fluid's circulation, and consisting of a boiler feed pump, a boiler heat-exchanger means having a separate heating fluid inlet and a heating fluid outlet, a hydrodynamic gas expander means and a condenser heat-exchanger means having a separate cooling fluid inlet and a cooling fluid outlet;

which arrangement comprises the continuous introduction of a liquid gas by pump to said boiler means at boiler pressure and its heating and evaporation therein, an adiabatic expansion of said heated vapor within said hydrodynamic expansion means to condenser pressure, the condensation of said vapor to initial state within said condenser means, and the reintroduction of said condensed gas by pump to boiler means, thus beginning a new cycle;

utilizing a condensible gas having a boiling point substantially lower than the condensation temperature of water at specific pressure;

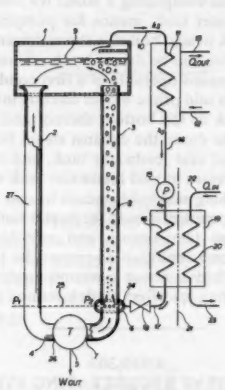
wherein said first heated vapor power cycle serves the purpose of continuously heating and cooling a quantity of said condensible gas;

which system further comprises a second closed hydrodynamic power extraction cycle, operating together with said first heated vapor cycle in an immiscible combined flow upward through their common tubular expansion means;

incorporating a vertically oriented, closed, non-condensible fluid circulation system, being connected in the proper sequence of said fluid's circulation, and consisting of a vertically oriented tubular gas expansion means having a gas inducer section at its lowermost portion, a hermetically sealed vapor separation means on the system's uppermost portion having a fluid inlet and a fluid outlet, as well as a vapor outlet, a vertically oriented tubular penstock, and a hydrodynamic power extraction turbine;

utilizing a non-compressible fluidic circulating medium;

wherein said first cycle's heated gas enters said second cycle's non-compressible fluid at said expansion means gas inducer section at a substantially higher pressure, to circulate immiscibly together through said common tubular expansion means, from its lowermost portion upwards, to be expanded therein into said separation means to condenser pressure and being separated from each other within said separation means;



whereafter, said expanded vapor, upon its separation from said non-compressible fluid, enters said condenser means to be condensed therein;

and said non-compressible fluid, upon its separation from said vapor, enters said vertically oriented fluid penstock in a downward flow, and through said turbine means at the system's lowermost portion, and on through said gas inducer means to begin a new cycle;

and in which power-producing system the introduction of said heated gas into said non-compressible fluid through said gas inducer section at the lowermost portion of said hydrodynamic expansion means, produces by virtue of said gas's expansion within said fluid and said vertical expansion means, the reduction of said common immiscibly upwards flowing mass' specific gravity as a whole;

as compared to the higher specific gravity of the separated downward flowing non-compressible fluid's mass, within the system's penstock;

giving rise to a difference in the hydrodynamic pressure heads between said turbine means' fluid inlet and its fluid outlet, thus giving rise to a circulation of said non-compressible fluid in the proper sequence through said second cycle's circulation system;

and in which system said turbine means is conveniently used for the conversion of said flowing fluid's kinetical energy, into rotary shaft work within said turbine means.

4,030,304

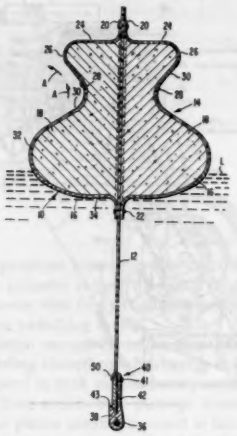
FLOATING BOOM

Robert E. West, Yardley, Pa., assignor to Cascade Industries, Incorporated, Edison, N.J.

Filed Mar. 17, 1976, Ser. No. 667,784

Int. Cl.² E02B *15/04, 3/00*

U.S. Cl. 61—1 F **1 Claim**



1. A boom for restricting the movement of buoyant material beyond a predetermined area on the surface of water, comprising:

a. an elongated, flexible skirt;

b. float means attached to said skirt; adjacent one longitudinal edge portion thereof, and adapted for supporting the skirt buoyantly upon the surface of water in a position in which the skirt is disposed as a barrier for confining said pollutants;

c. means at opposite ends of each skirt for connecting the same to like boom structures, whereby to provide a continuous boom capable of being floated into place in position extending about said area within which the pollutants are to be confined;

d. an elongated, flexible tension element generally coextensive in length with the skirt and extending along the opposite longitudinal edge of said skirt; and

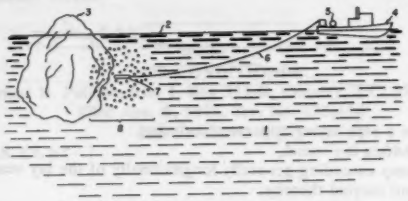
e. means for attaching said tension element to the skirt, the means for attaching the tension element being fixedly secured, at spaced locations along its length, both to the skirt and to the tension element, said tension element having exposed portions between the points of permanent securement thereof to said attaching means, whereby to relieve the skirt of stresses encountered during operation of the equipment, said means for attaching the tension element to the skirt comprising clamp assemblies spaced longitudinally of the skirt, each clamp assembly including a main clamp element having a longitudinal bore through which the tension element extends, and a second clamp element lockingly engageable with the main clamp element in position to deform and lock the skirt between the main and second clamp elements, said main and second clamp elements having confronting, serrated, mating locking faces in embracing relation to the skirt; said means for effecting permanent securement of the tension element to the skirt comprising swaging of the main clamp element to the tension element.

4,030,305

METHOD OF MOVING A FLOATING BODY INTO A PREDETERMINED FLOAT PATH

Leland Earl Wilson, Vanlose, Denmark, assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 23, 1976, Ser. No. 725,823
Int. Cl.² E02B *15/00*; B63B *51/00*
U.S. Cl. 61—1 R 5 Claims



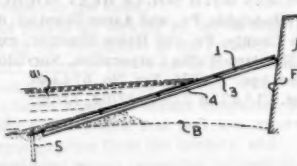
1. In a method for moving a body in a predetermined float path which is different from said body's natural drift path, said body floating in a liquid, the improvement comprising reducing the density of the liquid in which said body is floating, said reduction in density being generally in the direction of said predetermined float path, thereby providing a path of lesser resistance for travel for said body, said path of lesser resistance being in the general direction of said predetermined float path.

4,030,306

APPARATUS FOR PREVENTING EROSION OF THE SEABED IN FRONT OF HYDRAULIC STRUCTURES

Ole Fjord Larsen, 62 Fasanvaenget, P.O. Box 604, DK 6700, Esbjerg, Denmark

Filed Aug. 14, 1975, Ser. No. 604,548
Int. Cl.² E02B *3/04*
U.S. Cl. 61—3 5 Claims



1. The combination of a lengthy hydraulic structure having a steep generally upright uniplanar face, an upper end and a lower end, said lower end being disposed below an upper water level surface of a body of water, a sheet of flexible material, said sheet of flexible material being composed at least of first and second flexible layers, said sheet having upper and lower edge portions, said sheet being disposed at an acute angle to said upright face with said lower edge portion being contiguous a bed of said body of water and said upper edge portion being contiguous said upright face at a point spaced above said bed and below said upper end, said first and second layers including a plurality of perforations, said second layer overlying said first layer, said second layer being taut and said first layer being relatively loose, means for maintaining said sheet of material disposed at said acute angle, and said maintaining means including means for securing said upper and lower edge portions to said hydraulic structure and said bed, respectively.

4,030,307

IMPERMEABLE ECOLOGICAL BARRIER AND PROCESS OF MAKING SAME FROM RECONSTITUTED SHALE

Armen G. Avedisian, P.O. Box 669, Hinsdale, Ill. 60162

Filed June 14, 1976, Ser. No. 695,461
Int. Cl.² E02D *15/00*
U.S. Cl. 61—35 10 Claims

1. A process for reconstituting shale to make an ecologically impermeable geologic barrier along a wall comprising the steps of:

a. primarily crushing solid, as-mined shale selected from the group consisting of Maquoketa Group shale, a shale identified by the presence of Cornulite fossils in the upper part thereof, and shale which is high in illite mineral content, to produce a readily compactible aggregate having a progressive gradation of sizes;

b. mixing water with said shale to provide a wetted aggregate;

c. spreading said wetted aggregate along said wall; and

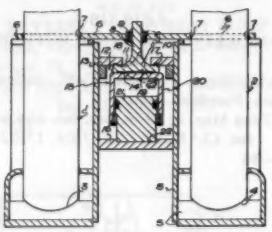
d. secondarily crushing and mixing said wetted aggregate in place against said wall to compact it to a substantially solid, impermeable state.

4,030,308

MINE ROOF SUPPORTS

Philip Dudley; Lewis Robert Bower, and Malcolm Wake, all of Wakefield, England, assignors to Fletcher Sutcliffe Wild Limited, England

Filed May 21, 1976, Ser. No. 688,939
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D 26 Claims



1. A mine roof support comprising roof beam means, base member means, and a pair of hydraulically extensible chock legs connected at upper ends thereof in articulated manner to said roof beam means and connected at lower ends thereof in articulate manner to said base member means, and rigid yoke means spaced from the base member means between and connecting together said pair of chock legs, the yoke means containing projecting pin means secured in bearing means attached to the yoke means, said pin means having lateral base means, one side of said lateral base means contained between abutment means secured to the base member means, the other side of the lateral base means secured to one end of a permanent load applying means, the other end of the permanent load applying means being supported by the base member means, said permanent load applying means permanently loading said lateral base means against said abutment means.

4,030,309

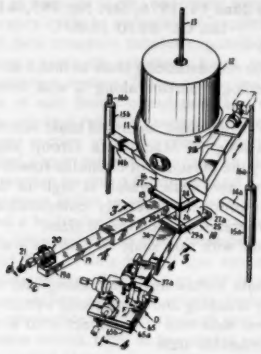
WORK ARM SYSTEM FOR SUBMERGIBLE CHAMBER

Burton Hoster Mason, Box 504, Covington, La. 70433

Filed May 18, 1976, Ser. No. 687,549
Int. Cl.² B63C *11/40*
U.S. Cl. 61—69 R 14 Claims

1. A work arm system for a submergible chamber comprising, a submergible chamber, means mounted to and outwardly disposed from the chamber to hold said chamber at a submerged depth adjacent a work area, first and second work

arms rotatably mounted to said chamber, said arms being in spaced relationship along the axis of the chamber, and where in said second extends outwardly from the chamber in two



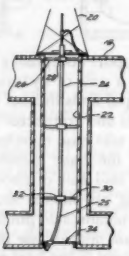
directions, and means at at least one end of each arm to mount a tool, so that the tool mount ends of at least two arms may be opposed to the work area.

4,030,310

MONOPOD DRILLING PLATFORM WITH DIRECTIONAL DRILLING

Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Filed Mar. 4, 1976, Ser. No. 664,011
Int. Cl.[2] E21B *7/12, 7/04, 15/02*
U.S. Cl. 61—86 **10 Claims**



1. Apparatus for providing directional drilling from a monopod ocean drilling platform having a submerged base, a column extending up from the base and supporting a platform above the water, the column having a vertical moon pool extending downwardly from the platform and opening in the base, comprising:

a conductor pipe for receiving a drill stem extending from the platform through the moon pool, at least a portion of the conductor pipe curving in an arc,

means rotatably supporting the conductor pipe in the moon pool adjacent the upper end,

means supporting the conductor pipe in the moon pool adjacent the lower end at a position displaced from the center of the moon pool, and means for rotating said means supporting the conductor pipe about a vertical axis offset from the position of the conductor pipe.

4,030,311

METHOD AND APPARATUS FOR ADJUSTABLY SUPPORTING A PIPELINE RELATIVE TO A LAY VESSEL

Andrew J. Rafferty, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed Jan. 19, 1976, Ser. No. 650,530
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—108 **10 Claims**

1. In a pipe laying apparatus including

a floating lay vessel,

a ramp extending generally longitudinally of the lay vessel and carried thereby,

a pipeline portion superposed on said ramp, and

a shoe carried by said ramp and adjustably supporting a portion of said pipeline on said ramp,

said shoe including cradling means for supporting the pipeline in longitudinally movable relation with the ramp, said cradling means simultaneously contacting opposite side portions of the underside of said pipeline;

the improvement in said shoe comprising:

elongated pivoting means, extending at least in part generally longitudinally of said ramp, for alternately raising and lowering said cradling means relative to the ramp, aaid elongated pivoting means being pivotally connected by first pivot means to the surface of the ramp and by second pivot means to said cradling means;

said first and second pivot means being mutually displaced longitudinally of said ramp, with said elongated pivoting means extending therebetween and defining a lifting lever arm extending between said ramp and said cradling means; and

rotating means for rotating said lifting lever arm about said first pivot means to support said pipeline relative to the ramp of the lay vessel;

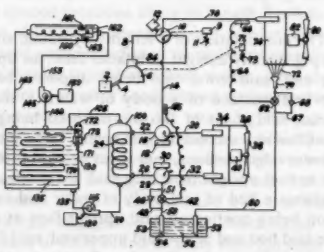
said cradling means, said lifting lever arm, and said rotating means being disposed entirely above, and not penetrating said ramp.

4,030,312

HEAT PUMPS WITH SOLAR HEAT SOURCE

Mark Wallin, Philadelphia, Pa., and Aaron Shantzer, deceased, late of Bucks County, Pa. (by Helen Shantzer, executrix), assignors to Shantzer-Wallin Corporation, Norristown, Pa.

Filed Apr. 7, 1976, Ser. No. 674,641
Int. Cl.[2] F25B *27/00, 27/02, 13/00*
U.S. Cl. 62—2 **13 Claims**



1. An improved reversible refrigeration system including conduit connected compressor and reversing means, said reversing means having a conditioning side and a service side; at least one conditioning heat transfer means subject to the conditioning side of the reversing means and positioned to

affect a conditioned space; wherein the improvement comprises; first service heat transfer means subject to the service side of the reversing means and adapted to transfer heat between refrigerant and a liquid; second service heat transfer means subject to the service side of the reversing means and adapted to transfer heat between refrigerant and air; and control means adapted to apportion the heat transferred on the service side between said first and said second service heat transfer means.

4,030,313

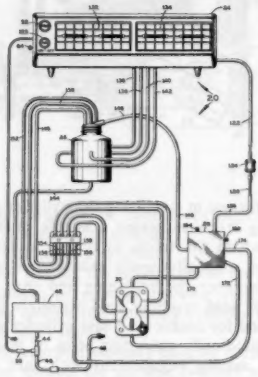
AIR CONDITIONER

Ernest H. Patrick, Rte. 1, Box 312-B, Conway, S.C. 29526

Filed Apr. 9, 1976, Ser. No. 675,616

Int. Cl.[2] F25B *19/00*

U.S. Cl. 62—7 **31 Claims**



19. An air conditioner for use in a vehicle having a gasoline engine with a fuel intake providing a source of reduced pressure comprising:

a gasoline vaporizer including a first outer tube, and a second inner tube within said first tube for discharging gasoline from the fuel system of the vehicle into said first tube to vaporize the same,

blower means for flowing air across said first tube to cool the air for circulation in the vehicle,

air inlet means to supply air to said first tube,

exhaust outlet means for said first tube,

vapor-liquid separator means connected between said exhaust outlet means and said fuel intake for separating excess gasoline from the mixture, and

proportioning means connected between said separator and said fuel intake for adjusting the fuel-to-air ratio at the fuel inlet.

4,030,314

METHOD AND APPARATUS FOR PRESERVING BIOLOGICAL MATERIALS

John Frederick Strehler, 1597 Prestwick, Grosse Pointe Woods, Mich. 48236; John Joseph Mikoliczeak, 32261 Arlington Drive, Birmingham, Mich. 48009, and Kirk Robert Strehler, 22462 Ardmore Park, St. Clair Shores, Mich. 48081

Filed Apr. 7, 1976, Ser. No. 674,504

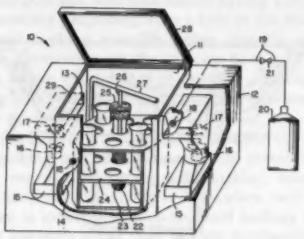
Int. Cl.[2] F25D *13/04*

U.S. Cl. 62—65 **16 Claims**

1. A process for preserving biological materials by freezing comprising the steps of:

cooling the biological material to a temperature equal to or minimally warmer than the freezing temperature of the material;

chilling the environment surrounding the biological material rapidly to a preselected temperature substantially colder than the freezing temperature of the material to initiate phase change of the material;



warming the environment surrounding the biological material from said preselected temperature to a temperature equal to or minimally cooler than the freezing temperature of the material during removal of the heat of fusion of the material; and

cooling the environment surrounding the biological material at a substantially linear preselected rate of temperature change to a preselected end temperature.

4,030,315

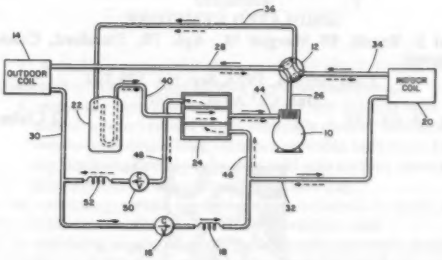
REVERSE CYCLE HEAT PUMP

James R. Harnish, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 2, 1975, Ser. No. 609,322

Int. Cl.[2] F25B *13/00*

U.S. Cl. 62—324 **4 Claims**

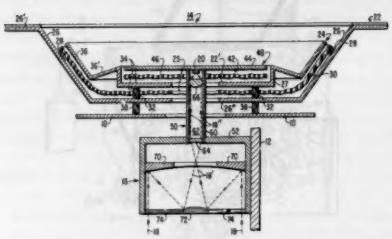


1. In a heat pump system of the type including a compressor; a fluid reversal means; an indoor coil; an outdoor coil; first and second expansion means; means for conducting refrigerant in a first closed circuit path from said compressor through said reversal means to said outdoor coil and then through said first refrigerant expansion means to said indoor coil and back to said compressor; said reversal means being adapted to be repositioned to allow refrigerant from said compressor to flow in a second closed circuit path to said indoor coil through said second refrigerant expansion means to said outdoor coil and then back to said compressor, the improvement comprising a heat exchanger for bringing fluid returning to said compressor into heat exchange contact with high pressure liquid from said indoor coil during flow in said second closed circuit path, and means for bypassing said heat exchanger during flow in said first closed circuit path.

4,030,316
PASSIVE COOLER

Albert Irving Aronson, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,760
Int. Cl.² F25B 25/00
U.S. Cl. 62—467 R 12 Claims



1. A passive device arranged to be mounted on a support body for maintaining an optical article at a given temperature in the presence of a thermal radiation sink comprising:

an article cooling and supporting member having a high emissive surface exposed to the ambient for cooling said article thermally coupled thereto,

a radiation shield member disposed in spaced relation with respect to said supporting member for inhibiting the impingement of thermal radiation on said supporting member, said shield member including means for mounting said shield member on said support body thermally isolated from said body and supporting member,

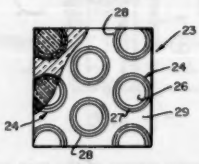
optical means arranged to be secured to said body for collecting selected radiation to be directed to said article, and

securing and optical coupling means connected to said supporting member and said optical means for directing said collected radiation to said article and for securing said supporting member to said optical means.

4,030,317
SIMULATED GEMSTONE

Paul S. Rogell, 95 Morgan St., Apt. 7B, Stamford, Conn. 06905

Filed July 16, 1973, Ser. No. 379,722
Int. Cl.² A44C 17/00
U.S. Cl. 63—32 12 Claims

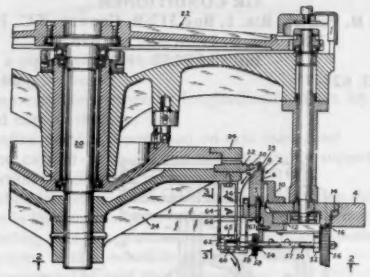


1. An ornamental artificial gem stone having a front face, comprising a body member of parallel light transmitting fibers, said fibers including respective cores of a first material having a first index of refraction, said cores extending across the gem stone to present their ends at the front face of the gem stone, said fibers further including respective coatings on the surfaces of said cores having a second index of refraction, said first index of refraction being greater than said second index of refraction, a light transmitting matrix surrounding said fibers throughout said body member, including a plurality of colored unclad light transmitting rods disposed throughout said matrix and distributed among said fibers, said colored unclad rods being of sufficient concentration in said matrix to impart their color to the gem stone.

4,030,318
DIAL AND CYLINDER CONNECTION

Morris Philip, c/o Philip Knitting Mills, 26 Bruckner Blvd., Bronx, N.Y. 10454

Filed Oct. 15, 1975, Ser. No. 622,480
Int. Cl.² D04B 9/06
U.S. Cl. 66—28 9 Claims

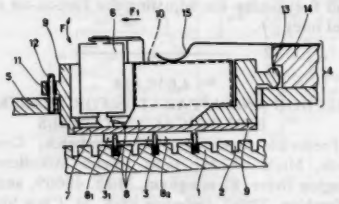


5. A stabilizer for use in stabilizing the cylinder and dial of a circular knitting machine having a needle operating cam arrangement in which the fabric circularly knitted by said machines includes a longitudinally extending strip of float yarns extending between the beginning and ends of rows of stitches knitted by said machine, said stabilizer including a first roller mounted for rotation on said cylinder against one side of said longitudinally extending strip of float yarns, a second roller in mating engagement with said first roller mounted for rotation on said dial against the other side of said longitudinally extending strip of float yarns and means driving one of said rollers at a constant speed relative to the knitting speed of said knitting machine for engaging and feeding said float yarns in said strip between said rollers and for feeding said circularly knit fabric past said engaged rollers.

4,030,319
DOMESTIC KNITTING MACHINE

Alfred Gloeckler, Mulhouse, France, assignor to Superba S.A., Mulhouse, France

Filed Apr. 23, 1976, Ser. No. 679,876
Claims priority, application France, Apr. 24, 1975, 75.13490
Int. Cl.² D04B 7/00, 15/66
U.S. Cl. 66—75.2 8 Claims



1. A domestic knitting machine consisting of at least one needle board, a plurality of knitting needles supported in grooves in the needle board, a movable carriage oriented parallel above and to the needle board, the carriage being provided with a lock fitted with an electromagnetic needle selection component, said electromagnetic component being

mounted on the lock by means of guiding means permitting free movement of said electromagnetic component in a direction substantially perpendicular to the plane of the needle board.

4,030,320

DECATIZING OF FABRICS

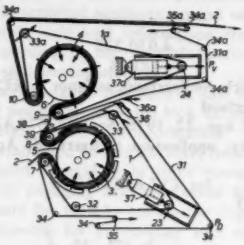
Dieter Riedel, Turmblick, Germany, assignor to Drabert Sohne, Minden, Germany

Filed Feb. 19, 1976, Ser. No. 659,536

Claims priority, application Germany, July 5, 1975, 2530138

Int. Cl.² D06B *5/08*

U.S. Cl. 68—5 R **16 Claims**



1. In apparatus for the continuous decatizing of a fabric,

at least one steaming cylinder,

at least one suction cylinder,

means for feeding the fabric around the cylinders,

a first length of primary backing cloth extending under tension around the steaming cylinder to press the fabric against the cylinder,

a second length of primary backing cloth extending under tension around the suction cylinder to press the fabric against the cylinder,

means for varying the tension in each of said lengths independently of the tension in the other said length,

a first seamless, endless, intermediate backing cloth located between the first said length of backing cloth and the fabric, and

a second seamless, endless, intermediate backing cloth arranged between the second said length of backing cloth and the fabric, said intermediate backing cloths moving with their associated lengths of backing cloths in the zone of the cylinders without slipping.

4,030,321

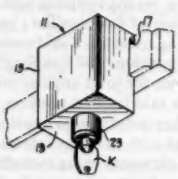
PADLOCK WITH PROTECTED SLIDE BOLT AND LOCKING MEANS

David L. Kenyon, 1727 W. Royalton Road, Broadview Heights, Ohio 44147

Filed June 16, 1976, Ser. No. 696,840

Int. Cl.² E05B *67/36*

U.S. Cl. 70—34 **8 Claims**



1. A padlock for attachment over a staple, which comprises:

a case having an opening for insertion of the staple;

a slide bolt within said case capable of extending through said opening to engage said staple;

a lock sleeve mounted within a cylindrical bore in said case, said lock sleeve being movable between a locked position and an unlocked position, said slide bolt being fixedly attached to said lock sleeve and extending through said opening to engage said staple when said lock sleeve is in said locked position, said lock sleeve having a retractable locking member projecting from a hole in the wall of said sleeve, said locking member being capable of fitting within an indentation on the interior bore wall to hold said lock sleeve in said locked position and capable of retracting into said hole to free said sleeve when in said unlocked position; and

a lock cylinder fixedly mounted within said sleeve having an interior locking mechanism operatively connected to a camming means for forcing said locking member to project outwardly through said hole when said locking mechanism is locked and allowing said locking member to retract inwardly when said locking mechanism is unlocked.

4,030,322

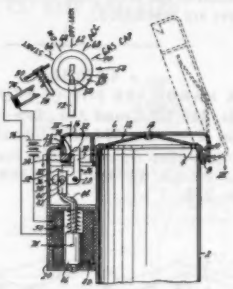
LOCKING GAS CAP SYSTEM

Charles E. Pettit, 12000 Moonlight Road, Olathe, Kans. 66061

Filed Apr. 28, 1976, Ser. No. 681,168

Int. Cl.² B65D *55/41;* **B60R** *25/00*

U.S. Cl. 70—159 **3 Claims**



1. A locking system for the cap of the gasoline tank of an automative vehicle, said locking system comprising:

a. manually operable locking means for locking said cap closed whenever said cap is manually closed, said locking means including a lock member movable between a locking position directly engaging said cap and an unlocking position out of engagement with said cap,

b. unlocking means operable when actuated to move said lock member to said unlocking position, and

c. operating means including a manually movable member disposed interiorly of said vehicle and operable by movement of said member to actuate said unlocking means, said unlocking means including a striker member operable to strike said lock member with a hammer blow to drive said lock member toward its unlocking position whenever said unlocking means is actuated.

4,030,323

ANTI-THEFT TRANSMISSION LEVER LOCK PLATE

John P. Stanislawczyk, Elizabeth, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 9, 1975, Ser. No. 639,053

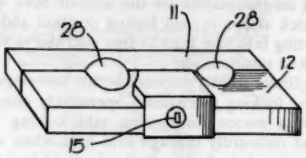
Int. Cl.² F16H *57/00*

U.S. Cl. 70—199 **1 Claim**

1. A detachable lock plate assembly for fitting about a transmission shift lever of a vehicle and a second fixed rod,

comprising a male plate member and a female plate member shaped to telescopically join each other in an engaged mode, with each plate member fitted with a pair of parallel grooves that form a pair of parallel through holes when the plate members are joined together, with locking means operated by a removable key that maintains the plates engaged in the locked mode.

said male plate member formed with a tubular shaft that projects perpendicularly from a surface of said member, said shaft being of an external shape to telescopically fit



into a through hole that extends from a surface of the female member, with each said surface of each member formed with said parallel grooves,

said shaft formed with an open axial hole, the internal surface of which hole is formed with a recess of a shape to engage a latch of said locking means,

said locking means consisting of a detachable tumbler that fits into the hole of the female plate member and the hole of the shaft of the male plate member when the two plate members are assembled.

4,030,324

LOCK HARDWARE FOR OUTBOARD MOTOR

Leo A. Rizio, 260 1/2 Grand Ave., San Jose, Calif. 95126

Continuation of Ser. No. 594,858, July 10, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,164

Int. Cl.[2] E05B *73/00*; **F16B** *41/00*

U.S. Cl. 70—232 **8 Claims**

1. Locking hardware for the clamp screws on the inboard arm of an outboard motor C clamp which clamp screws have pad ends adapted to press against the transom board of a boat and the like by turning of transverse handles on the opposite ends of such clamp screws; said locking hardware comprising:

1. a back plate adapted to be disposed between the pad ends of such clamp screws and the transom board and secured thereto thereby;
2. a stud bolt mounted on said back plate and extending inboard therefrom parallel to and in the same horizontal plane as the clamp screws:
3. a channel iron cover member having a main body for receiving and confining the handles of the clamp screws within the web and flanges thereof and having a bored hole formed through the web portion of said main body thereof for passage of the threaded end of said stud bolt therethrough;
4. a pair of channel iron legs on the ends of said cover member disposed in the same horizontal plane and parallel to said stud bolt and clamp screws and with the free ends of said legs engaging said back plate;
5. means between the main body of said cover member and said back plate providing a chamber for confining said stud bolt;
6. a cylindrical shell formed on the inboard face of the web portion of the main body of said cover member in axial alignment with the bored hole formed therethrough for receiving and concealing the threaded end of said stud bolt projecting therefrom;
7. a lug nut confinable within said cylindrical shell and threadedly connected to the threaded end of said stud bolt for securing the cover member thereto;
8. a key operated locking means in the free end of said lug nut; and
9. a key adapted to fit the key operated locking means in said lug nut for locking the lug nut within and against removal from said cylindrical shell.

4,030,325

LOCK

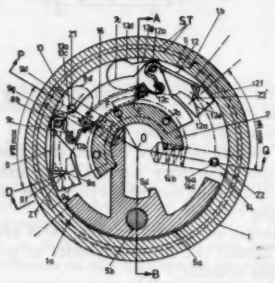
Kurt Ehrat, Zurich, Switzerland, assignor to KESO AG, Richterswil, Switzerland

Filed Apr. 22, 1975, Ser. No. 570,422

Claims priority, application Switzerland, Apr. 25, 1974, 5802/74

Int. Cl.[2] E05B *25/00*

U.S. Cl. 70—383 **12 Claims**



1. A lock comprising:

a. a stator having an inner wall of circular cross section defining an axis;

b. a main rotor mounted in said stator for rotation about said axis,

1. said main rotor defining an axially open keyhole therein;

c. a key carrying a plurality of key information elements, said key

1. being dimensioned for axial insertion into said keyhole and
2. including means for moving said main rotor about said axis between an angularly terminal, open lock position and an angularly terminal, closed lock position through an intermediate latched position when the inserted key is turned about said axis;

d. an auxiliary rotor mounted in said stator for rotation about said axis;

e. differential drive means coupling said main and auxiliary rotors for rotation of said auxiliary rotor relative to said main rotor during rotation of said main rotor into and out of said latched position, and coupling said auxiliary rotor to said main rotor for joint angular movement while said main rotor is in said latched position;

f. a plurality of key information sensing elements respectively associated with said key information elements,

1. said sensing elements being movably mounted on said auxiliary rotor for engagement by the respective associated key information elements during said rotation of said auxiliary rotor relative to said main rotor and for angular displacement from a starting position relative to the auxiliary rotor by the engaged key information

elements, while said main rotor moves from one of said terminal positions toward said latched position;

g. abutment means on said main rotor for disengaging said sensing elements from the associated key information elements in response to movement of said main rotor from said latched position toward the other terminal position and for returning the disengaged sensing elements to said starting position;

h. a plurality of lock information elements associated with respective sensing elements,

1. said lock information elements being mounted on said auxiliary rotor for angular movement about said axis;

i. coupling means coupling said lock information elements to the associated sensing elements for joint angular movement responsive to movement of said main rotor from one of said terminal positions toward said latched position, whereby said lock information elements are positioned according to the key information elements engaged by said sensing elements,

1. the relative angular positions of said sensing elements and the associated, coupled lock information elements constituting stored lock information;

j. test means mounted on said auxiliary rotor and responsive to movement of said main rotor toward said latched position for engaging said positioned lock information elements and for thereby testing the engaged key information elements for conformity with said stored lock information; and

k. bolt means mounted on said main rotor for movement between and effective position and an ineffective position, said bolt means when in said effective position preventing movement of said main rotor from said latched position into said open lock position,

1. said test means including means for moving the bolt means into said ineffective position in response to conformity of the engaged key information elements with said stored lock information.

4,030,326
GAGE CONTROL APPARATUS AND METHOD FOR TANDEM ROLLING MILLS

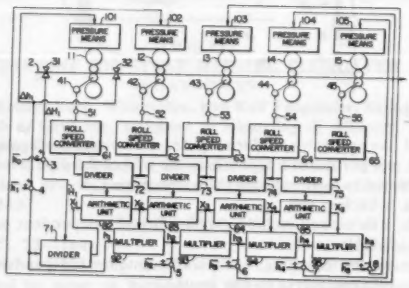
Yasuo Morooka, and Shinya Tanifuji, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 20, 1976, Ser. No. 716,281

Claims priority, application Japan, Aug. 25, 1975, 50-102163

Int. Cl.² B21B *37/00*

U.S. Cl. 72—8 **15 Claims**



11. A gage control apparatus for a tandem rolling mill including a plurality of individual mill stands one of which is determined as a particular stand, comprising:

means for detecting a deviation of a thickness of a plate to be rolled at least at the input or output side of said particular stand from desired thicknesses at said input and output sides,

means for obtaining the thicknesses of the plate at the input and output sides of said particular stand on the basis of said detection,

means for obtaining a thickness ratio between said thicknesses of the plate,

means for detecting a circumferential speed of a roll of each of said stands,

means for obtaining a circumferential speed ratio between the circumferential speeds of the rolls of adjacent said stands,

means for calculating a thickness of the plate at the output or input side of said stands other than said particular stand on the basis of said thickness ratio and said circumferential speed ratios,

means for obtaining a deviation of said calculated thickness from a desired thickness at the output or input side of each of said stands other than said particular stand, and

means provided in association with respective said stands for adjusting a screw-down position of each of said stands in dependence on said deviation.

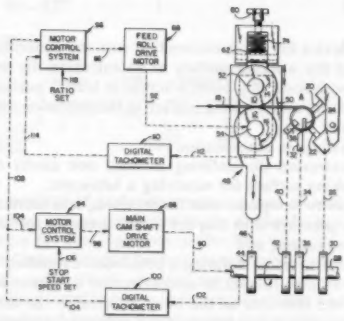
4,030,327
SPRING COILING MACHINE WITH IMPROVED DRIVE MEANS

Charles P. Collins, Torrington, and Bernard P. Lampietti, Goshen, both of Conn., assignors to Torin Corporation, Torrington, Conn.

Filed June 16, 1976, Ser. No. 696,777

Int. Cl.² B21F *3/02, 35/00*

U.S. Cl. 72—23 **18 Claims**



1. In a spring coiling machine, the combination of at least one pair of feed rolls for intermittently longitudinally advancing an elongated length of wire from a source of supply whereby successively to feed integral leading end portions thereof to a coiling station, at least one coiling tool at said station arranged to engage said successively advanced leading end portions and to obstruct feed movement thereof whereby progressively to coil the same into springs, at least one cut-off tool at said coiling station operable successively to sever the springs at the termination of said coiling operations, a rotary camshaft and associated operating means for said coiling and cut-off tools, a drive means for said camshaft comprising a first electric motor connected with the camshaft and operable to effect continuous rotation thereof, a drive means for said feed rolls comprising a second electric motor connected with the rolls and operable to effect continuous rotation thereof, electrical control means including speed ratio selection and maintenance means connected with said two motors and adapted initially to accommodate manual motor speed ratio selection and thereafter to maintain automatically and precisely selected ratios of motor speed, and means separate from said second electric motor connected with said feed rolls and with said camshaft and operable in response to the latter successively to terminate wire advancement by said feed rolls

in timed relationship with the operation of said coiling and cut-off tools.

4,030,328

DEVICE FOR CONTINUOUS LUBRICATION OF AN EXTRUSION DIE

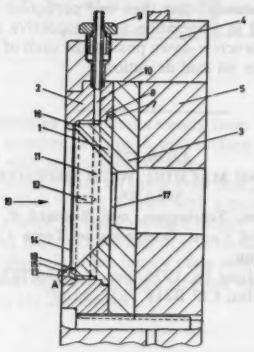
Alfred Wagner, Im Staudler 12, Steisslingen, Germany (D-7705), and Hermann Kidratschky, Hombollstrasse 1, Hilzingen, Germany (D-7701)

Filed Dec. 4, 1975, Ser. No. 637,594

Claims priority, application Switzerland, Dec. 5, 1974, 16146/74; Germany, Dec. 14, 1974, 2459172

Int. Cl.² B21C *23/32*

U.S. Cl. 72—45 **5 Claims**



1. A device for use in connection with the continuous lubrication of the working surface of an extrusion die during the extrusion process of a billet wherein at least a portion of said billet passing said working surface in the extrusion direction is in a plastic state,

comprising, in combination:

said extrusion die defining at least one cavity near said working surface for receiving a lubricant;

said cavity being operable for receiving said lubricant under low pressure with respect to the pressure for said extrusion process; and

said extrusion die defining a projection extending over said cavity with respect to said extrusion direction for reducing the flow rate of the billet material in the area of said projection independent of the extrusion pressure,

whereby, during said extrusion process, said billet portion flows, retarded by said projection over said projection past said cavity defining a dead space so that said lubricant can be expelled through said dead space to said working surface at said low pressure.

4,030,329

DEVICE FOR ELECTRICAL DISCHARGE FORMING

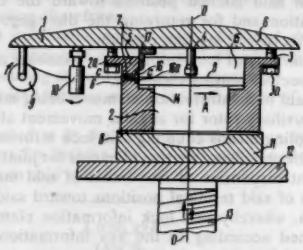
Viktor Nikolaevich Chachin, bulvar Lunacharskogo, 8, kv. 21; Alexandr Julyanovich Zhuravsky, prospekt Partizansky, 28, korpus 2, kv.135; Gennady Nikolaevich Zdor, ulitsa V.Khoruzhei, 19, kv. 14; Vladimir Leontievich Shaduya, ulitsa Pervomaiskaya, 8, kv. 7, and Elena Yakovlevna Golovkina, ulitsa Kakhovskaya, 37, kv. 42, all of Minsk, U.S.S.R.

Filed July 12, 1976, Ser. No. 704,177

Int. Cl.² B21D *26/02*

U.S. Cl. 72—56 **3 Claims**

1. A device for electrical discharge forming comprising: a fixed plate; an explosion chamber mounted on said fixed plate; a die pressed against said explosion chamber in the course of forming; an electrode accommodated in said explosion chamber; a wall of said explosion chamber serving as the other electrode and having a hole; a wire passing through said hole and intended to connect electrically said electrodes; a step made in said wall at the side opposite to that adjoining said die and located somewhat lower than said hole for the passage of said wire, two knives for cutting of said wire, one of said two knives being secured rigidly near said hole and the other one of said two knives being movably installed near said hole for



moving along the geometrical axis of said explosion chamber so that when said die moves together with said explosion chamber towards said fixed plate, said two knives approach each other and cut off said wire whose sheared end then comes to rest on said step.

4,030,330

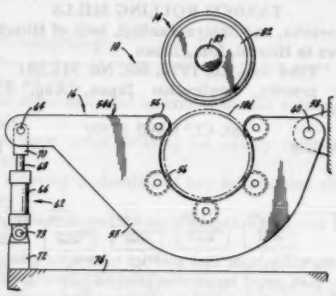
MULTIPLE ROLL RECORRUGATOR

Adrienus Marinus Nyssen, Chilliwack, and Gerhard Josef Rauch, Surrey, both of Canada, assignors to Ironside's Machine & Welding Ltd., Chilliwack, Canada

Continuation-in-part of Ser. No. 621,398, Oct. 10, 1975, abandoned. This application Aug. 20, 1976, Ser. No. 716,166

Int. Cl.² B21D *19/04*

U.S. Cl. 72—105 **17 Claims**



1. An apparatus for forming circumferential corrugations in the end portion of a pipe where the wall of the pipe is inserted between two corrugating rolls, comprising

a. a backup roll,

b. a thrust roll including a plurality of independent parallel roll elements,

c. means mounting said roll elements for independent motion transverse to one another,

d. means to engage said backup roll and said thrust roll with the wall of the end of the pipe therebetween,

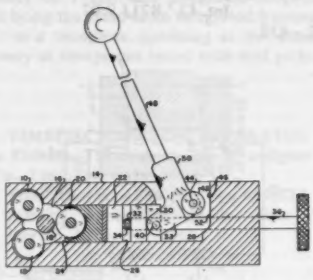
e. drive means associated with said thrust roll to rotate said roll elements in unison, and

f. means to independently support each of said roll elements and retain said roll elements in contact with the end portion of the pipe so that the roll elements will form circumferential corrugations in the wall of the pipe as the pipe wall is driven between the thrust and backup rolls.

4,030,331
KNURLING TOOL

David E. Keasling, 1128 McGovock, Tullahoma, Tenn. 37388

Filed Dec. 27, 1976, Ser. No. 754,731
Int. Cl.² B21D *19/06*
U.S. Cl. 72—110 4 Claims



1. A knurling tool comprising:

a frame having an opening from one side to an opposite side through which a workpiece to be knurled may be extended, and having an elongated slot in said frame extending normal to and connecting with said opening;

a first moveable block positionable in and along said slot adjacent to said opening;

at least three knurling wheels journalled to rotate on parallel axes about said opening and about a workpiece, all said wheels being supported by said frame with at least one of said knurling wheels being mounted on said first block, in turn supported by said frame;

a second movable block positionable in and along said slot adjacent to said first block, and said second block having a threaded opening extending longitudinally through it in the direction of said slot;

an adjustment screw threaded through said threaded opening in said second block and adapted to adjustably separate said first and second blocks; and

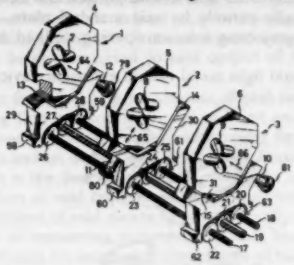
locking means for selectively locking and unlocking said second block against travel in said slot in a direction away from said first block, whereby after once having longitudinally adjusted said screw with said locking means in a locked position to effect a desired relative position of said first and second blocks, and thereby between said knurling wheels, said locking means may be locked and unlocked to freely relatively move said knurling wheels with respect to a workpiece without affecting the adjustment.

4,030,332
MACHINE FOR STRAIGHTENING ELONGATED WORKPIECES

Rolf Eckart Koch, Witzhelden, and Ralf Fangmeier, Solingen, both of Germany, assignors to Kieserling & Albrecht, Solingen, Germany

Filed June 24, 1976, Ser. No. 699,641
Claims priority, application Germany, June 25, 1975, 2528243
Int. Cl.² B21D *3/02*
U.S. Cl. 72—164 10 Claims

1. A straightening machine for elongated workpieces adapted to move at high speed through the straightening machine, comprising an elongated machine bed; and a plurality of straightening stands mounted on said machine bed displaceable with respect to each other in the direction of the elongation of the bed; each of said straightening stands comprises a cage, a roll set having four rolls mounted in the cage with two of the rolls turnable about horizontal axes and two of the rolls turnable about vertical axes, a cage holder supporting the cage and displaceable mounted on the machine bed, guide means on each of the cage holders for mounting the cage thereon adjustable in the direction of said guide means, the guide means on said plurality of cage holders being located in parallel planes normal to the elongation of said bed and the

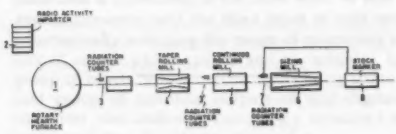


guide means on the cage holders of successive stands extending, as viewed in the direction of movement of the workpieces, normal to each other.

4,030,333
METHOD AND MEANS FOR SEPARATING SUCCESSIVE ROLLING LOTS

Manfred Bellmann, Breitscheid, and Hannes Goldberg, Mulheim, both of Germany, assignors to Mannesmann Aktiengeselischaft, Dusseldorf, Germany

Filed Sept. 16, 1976, Ser. No. 723,695
Int. Cl.² B21B *39/00*
U.S. Cl. 72—227 5 Claims



1. The method of gaplessly separating and identifying successive rolling lots or batches of ingots or blooms in a production process for making tubes or the like when the stock is introduced into a furnace for heating and subsequently rolled, comprising radioactively marking the first or the last ingot of a given rolling lot of ingots at its subsequently lost end prior to being introduced into the furnace; and interposing a radioactive radiation responsive signal device before rolling.

4,030,334
PROCESS FOR THE MANUFACTURE OF COMPOSITE SECTIONS AND A DEVICE FOR CARRYING THIS OUT

Alfred Wagner, Steisslingen, and Hermann Kidratschky, Hilzingen, both of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

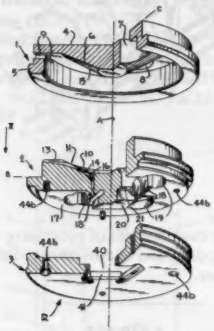
Filed Mar. 24, 1975, Ser. No. 561,239
Claims priority, application Germany, Mar. 23, 1974, 2414178
Int. Cl.² B21C *23/24, 25/04*
U.S. Cl. 72—258 16 Claims

1. An extrusion process for use in connection with an extrusion device including an entry plate, a mandrel plate, and a die plate defining a die bearing having an axis for manufacturing a composite section including at least a light metal and another metal, the steps comprising:

providing on opposite sides of said device channels defined by said entry plate and said mandrel plate, each of said channels having a first portion extending substantially radially and being defined substantially entirely by said entry plate, having a second portion extending along a curved path from said first portion and being defined

substantially by the combination of said entry and mandrel plates, and having a third portion extending substantially axially from said second portion and being defined substantially entirely by said mandrel plate, said third portion projecting into an opening defined in said die plate;

supplying said light metal to said extrusion device;



supplying said other metal in a solid preformed state to said extrusion device through said channels for extrusion along with said light metal;

extruding said light metal, whereby said light metal flows while said other metal is substantially unchanged in its physical form.

4,030,335

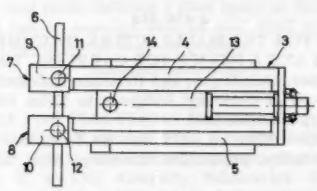
MULTI-FUNCTION METAL-WORKING MACHINE

Walter Allenspach, Bachtobelstrasse 66, Ottoberg (Thurgau), Switzerland

Filed Mar. 13, 1975, Ser. No. 558,118

Int. Cl.² B21D 7/06

U.S. Cl. 72—389 **11 Claims**



1. A multi-function metal-working machine, comprising a support having spaced ends and a longitudinal passage extending intermediate said ends; a carriage mounted for displacement in and lengthwise of said passage; moving means for moving said carriage; at least one first tool holer on said carriage; mounting means located at least at one of said ends for mounting at least one second tool holder; a plurality of tool holders mountable on said mounting means; tool mounting devices on at least some of said tool holders for detachably mounting tools thereon, said device including projecting stub shafts; and comprising rotating means for rotating said stub shafts and thereby the tools thereon.

4,030,336

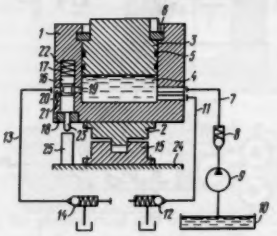
HYDRAULIC PROTECTION DEVICE FOR PRESSES

Anatoly Sergeevich Grigorenko, ulitsa Tovstukho, 1, kv. 21; Jury Antonovich Moroz, ulitsa Fugenfirova, 11, kv. 91, and Vladimir Vladislavovich Landyshev, ulitsa 50 let komsomola, 14-a, kv. 22, all of Omsk, U.S.S.R.

Filed July 9, 1976, Ser. No. 703,850

Int. Cl.² B21J 9/02

U.S. Cl. 72—432 **2 Claims**



1. A hydraulic overload protection device for a press, adapted to protect this press from overloads upon the movable member of this press, carrying thereon a die, having been driven through the maximum length of the stroke thereof, comprising: a hollow housing; a piston accommodated within this hollow housing; a space defined within said hollow housing by said piston, communicating via a check valve with a source of working liquid and also communicating via a pressure relief valve with a drain, characterized in that said space is additionally communicated with the drain via a line including an adjustable pressure relief valve and a device for disconnecting the said space from the drain upon the movable member of the press, carrying thereon the die, having been driven through the maximum length of its stroke.

4,030,337

PICKUP FOR MEASURING THE RATE OF AN ELECTRONIC TIMEPIECE

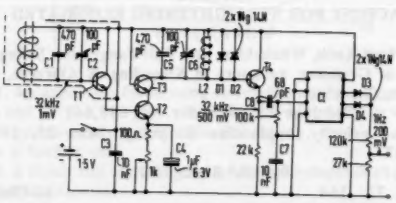
Daniel Bichsel, La Neuveville, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Oct. 21, 1975, Ser. No. 624,418

Claims priority, application Switzerland, Oct. 30, 1974, 14510/74

Int. Cl.² G04D 7/12

U.S. Cl. 73—6 **6 Claims**



1. A pickup adapted for detecting signals from the oscillator of a high-frequency electronic timepiece and for providing an output signal at a nominal frequency of 1Hz, said pickup being usable by a chrono-comparator designed for the determination of the instantaneous rates of mechanical or sonic frequency timepieces by comparing the timepieces' actual frequencies with an ideal frequency of 1 Hz obtained from a reference standard, said pickup comprising:

a detection means for detecting said signals of said high-fre-

quency timepiece and providing an actual signal corresponding to the frequency of the timepiece oscillator signals, and

an integrated frequency divider circuit connected to said detection means for dividing the frequency of said actual signal and for providing said output signal at said nominal frequency of 1 Hz, said integrated frequency-divider circuit being the same as an integrated frequency-divider circuit in a timepiece operating at the same oscillator frequency as timepieces tested with said pickup means.

4,030,338

TIMEPIECE TESTING APPARATUS

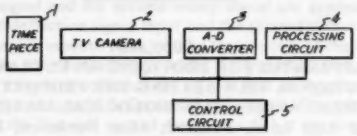
Heihachiro Ebihara, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed June 10, 1976, Ser. No. 694,574

Claims priority, application Japan, June 12, 1975, 50-71236; July 25, 1975, 50-90860

Int. Cl.² G04B *17/00*

U.S. Cl. 73—6 **13 Claims**



1. An apparatus for testing the accuracy of a timepiece comprising:

a television camera for converting the time displayed on said timepiece into an electrical signal;

a means for converting the electrical signal into a digital signal; and

a processing means for determining the time displayed on the timepiece from the digital signal and for comparing the displayed time to a time standard.

4,030,339

IMPACT IMPULSE MEASURING DEVICE

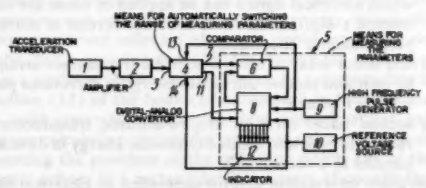
Alexandr Sergeevich Yakshin, ulitsa Malaya Filevskaya, 66, kv. 104; Oleg Nikolaevich Novikov, ulitsa Kuznetsky most, 18/7, kv. 6; Dmitry Alexeevich Grechinsky, ulitsa Tolbukhina, 8, korpus 2, kv. 48; Viktor Alexandrovich Klochko, ulitsa Oktyabrskaya, 38, kv. 374, and Viktor Georgievich Rygalin, 3-Dorozhny proezd, 5, korpus 2, kv. 103, all of Moscow, U.S.S.R.

Filed Feb. 17, 1976, Ser. No. 658,687

Claims priority, application U.S.S.R., Feb. 28, 1975, 2109015

Int. Cl.² G01N *3/30*

U.S. Cl. 73—12 **8 Claims**



1. An impact impulse measuring device comprising:

an acceleration transducer having an output and converting mechanical oscillation of an object being tested into electric signals;

an amplifier unit having an input and an output, said input being connected to said output of said acceleration transducer, said amplifier unit receiving said electric signals arriving from said acceleration transducer;

a means for automatically switching the range of measuring parameters of said impact impulse having first, second and third inputs and first and second outputs, said first input being connected to said output of said amplifier unit;

a means for measuring parameters of said impact impulse having first and second inputs and first and second outputs and including a comparator having first and second inputs and an output, said first input of said comparator, which is the first input of said means for measuring parameters of said impact impulse, being connected to the first output of said means for automatically switching the range of measuring parameters of said impact impulse, said means for measuring parameters of said impact impulse further including a digital-analog converter having a reset bus, which is the second input of said means for measuring parameters of said impact impulse and first, second and third inputs, an output, and a group of counting outputs, said reset bus being connected to the second output of said means for automatically switching the range of measuring parameters of said impact impulse, the first input and said output of said digital-analog converter being connected to said comparator, a high-frequency pulse generator having an output which is the first output of said means for measuring parameters of said impact impulse and is connected to the second input of the digital-analog converter and the second input of said means for automatically switching the range of measuring parameters of said impact impulse, a reference voltage source having an output which is the second output of said means for measuring parameters of said impact impulse and is connected to the third input of said digital-analog converter and the third input of said means for automatically switching the range of measuring parameters of said impact impulse, and an indicator having a group of inputs, said group of inputs being connected to said group of counting outputs of said digital-analog converter, said indicator indicating a measured value of said parameter of said impact impulse.

4,030,340

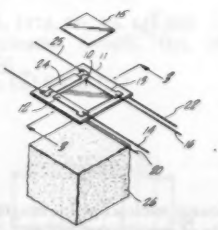
HYDROGEN GAS DETECTOR

Shih-Chia Chang, Santa Ana, Calif., assignor to General Monitors, Inc., Costa Mesa, Calif.

Filed July 22, 1976, Ser. No. 707,678

Int. Cl.² G01N *27/04*

U.S. Cl. 73—23 **12 Claims**



1. An article for detecting the concentration of hydrogen in the atmosphere, comprising:

a semiconductor detecting film comprising stannic oxide and deposited onto an inert substrate;

electrode means connected to said film; and a hydrogen activation film deposited onto said semiconductor detecting film.

4,030,341
FLUID APPLICATION DEVICE

Kevin J. Sullivan, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed July 24, 1975, Ser. No. 598,590
Int. Cl.² G01N 1/00
U.S. Cl. 73—61.1 C 4 Claims

1. A device for applying a fluid to a surface comprising

a housing having two broad opposing surfaces and a plurality of peripheral edge surfaces, one of said peripheral edge surfaces forming at least a part of the fluid applying face of said device, said applying face having a convex curvature,

means embodied within said housing defining a longitudinal aperture adapted to receive a discrete capillary tube, said aperture extending from one of said edge surfaces substantially parallel to said broad opposing surfaces,

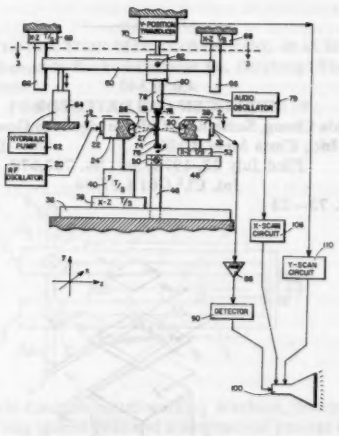
means embodied within said housing defining a groove formed substantially entirely in said applying face of said device to a depth sufficient to permit said groove to communicate with said longitudinal aperture, said groove having a width of a dimension so as to retain any fluid disposed therein by surface tension until said fluid contacts said surface, said groove being tansverse to said longitudinal aperture and intersecting said longitudinal aperture at one end thereof, said groove forming a part of said applying face of said device, and

a discrete capillary tube disposed within said longitudinal aperture.

4,030,342
ACOUSTIC MICROSCOPE FOR SCANNING AN OBJECT STEREO-OPTICALLY AND WITH DARK FIELD IMAGING

Walter L. Bond, Los Altos, Calif.; Cassius C. Cutler, Holmdel, N.J., and Ross A. Lemons, Mountain View, Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Sept. 18, 1975, Ser. No. 614,359
Int. Cl.² G01N 29/00
U.S. Cl. 73—67.5 R 36 Claims



1. An acoustic microscope for imaging an object of interest at a plurality of aspects, comprising:

a. an acoustic transmitter for generating focused acoustic waves along an axis of propagation and having an acoustic lens at one end thereof for focusing the acoustic waves to a focal point;

b. an acoustic receiver for receiving along an axis of reception the acoustic waves propagated from the transmitter, said receiver having an acoustic lens at one end thereof for recollimating the received waves and a transducer opposite thereto for converting the recollimated waves into electrical signals;

c. means for positioning the acoustic lens of the acoustic transmitter and the acoustic lens of the acoustic receiver so that the focal points of each lens are coincident with each other;

d. means providing relative movement between the object and the microscope in a planar scanning pattern while maintaining the coincident focal points of each lens in the plane of the scanning pattern so that the object of interest modulates the acoustic waves and the electrical signals from the transducer converted therefrom; and

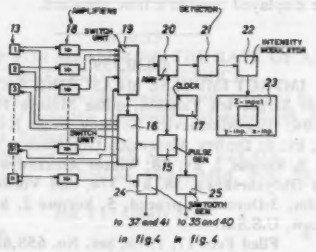
e. means for rotating the plane of the scanning pattern about an axis passing through the coincident focal points of the lenses while maintaining the coincident focal points of each lens in the plane of the scanning pattern so that the object of interest can be imaged in a plurality of aspects; and

f. means connected to the transducer for recording the electrical signals corresponding to the acoustic waves modulated by the object of interest.

4,030,343
APPARATUS FOR PROVIDING AN ULTRASONIC SECTIONAL VIEW STATING THE PROPORTION OF MEAT AND LARD IN BIOLOGICAL MATERIAL

Svend Aage Lund, Birkerod; Allan Northeved, Bagsvaerd; Poul Solfjeld, Vanlose, and Knud Christian Claus Fabrin, Farum, all of Denmark, assignors to Akademiet for de tekniske Videnskaber, Svejsecentralen, Glostrup, Denmark

Filed Nov. 19, 1975, Ser. No. 633,311
Claims priority, application Denmark, Nov. 19, 1974, 6011/74
Int. Cl.² G01N 29/04
U.S. Cl. 73—67.8 S 4 Claims



1. An apparatus for carrying out an ultrasonic inspection of a body comprising:

an oscilloscope having a screen, an intensity modulation input, and first and second deflection signal inputs to which electrical signals can be applied to cause the oscilloscope's electron beam to scan the screen in mutually perpendicular directions;

a first linear array of electro-acoustic transducers arranged to emit and receive ultrasonic energy in directions parallel to a first axis;

a second linear array of electro-acoustic transducers arranged to emit and receive ultrasonic energy in directions parallel to a second axis;

an angle information unit for generating an electrical signal dependent on the angle of inclination of the first axis with respect to the second axis;

a pulse generator for generating a train of electrical pulses at a predetermined frequency;

switching means connected to the pulse generator for activating the transducers of the first and second arrays in turn whereby the transducers are successively enabled to

emit pulses of ultrasonic energy and are successively rendered receptive to echoes of ultrasonic energy; and

means for displaying ultrasonic echoes received successively by the transducers on the oscilloscope screen, which means comprise means connecting the transducers to the intensity modulation input of the oscilloscope to cause the electron beam of the oscilloscope to increase in intensity when an ultrasonic echo is received by a transducer which is activated by the switching means, a first sweep generator connected to the pulse generator for generating a first sweep signal at said predetermined frequency, a second sweep generator connected to the switching means for generating a second sweep signal at a frequency equal to said predetermined frequency divided by the total number of transducers in said first and second arrays, an analog calculating circuit connected between the first and second sweep generators and the first and second deflection signal inputs of the oscilloscope and a gate circuit connected between the angle information unit and the analog calculating circuit for transmitting the electrical signal generated by the angle information unit to the analog calculating circuit only when the transducers of the second array are activated, whereby the first sweep signal and the second sweep signal are applied to the first deflection signal input and the second deflection signal input respectively when the transducers of the first array are activated whereas when the transducers of the second array are activated the signals that are applied to the first and second deflection signal inputs depend not only on the first and second sweep signals but also on the electrical signal generated by the angle information unit.

4,030,344
APPARATUS FOR RECORDING AN ULTRASONIC SECTIONAL VIEW

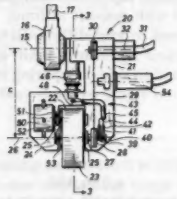
Allan Northeved, Bagsvaerd; Knud Christian Claus Fabrin, Farum, and Poul Solfjeld, Horsholm, all of Denmark, assignors to Akademiet for de tekniske Videnskaber, Svejsecentralen, Denmark

Filed May 7, 1976, Ser. No. 684,437

Claims priority, application Denmark, May 12, 1975, 2084/75

Int. Cl.² G01N 9/24

U.S. Cl. 73—67.8 S **4 Claims**



1. An apparatus for recording an ultrasonic sectional view comprising a transducer head (**20**) with a pulse circuit for transmission and reception of ultrasonic energy, means for visualizing received reflected ultrasonic signals on a cathode-ray tube, and a scanning arm (**17**) for moving the transducer head in a sectional plane along a plane curve corresponding to the outline (**11**) of the body (**10**) examined in the sectional plane, said apparatus comprising data potentiometers and analogous calculating circuits for producing electrical signals representing the positions of the reflection points (**P**) of the ultrasonic echoes in a rectangular XY-system of coordinates in the sectional plane, characterized by the transducer head (**20**) comprising four ultrasonic transducers (**33**) built into the periphery of a transducer wheel (**23**) at equidistant angular distance for bound rotation about an axis (**26**) perpendicular to the sectional plane, said transducer wheel (**23**) comprising means for separately and successively cutting the transducers (**33**) in and out of the pulse circuit in such manner that each transducer covers only a sector (angle D) from $-45°$ to $+45°$ about a symmetry axis (**49**) for the transducer head (**20**), the transducer head comprising a sine-cosine potentiometer (**50**) mechanically coupled to the transducer wheel (**23**) for the registration of the angle (D), and by the apparatus comprising means for resetting the angle (D) 90°, said angle being registrated by the sine-cosine potentiometer at each changing over from one transducer (**33**) to the subsequent one.

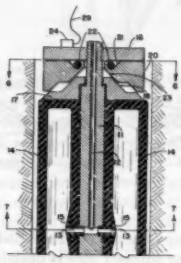
4,030,345
BOREHOLE PRESSURE CELL

Tibor O. Edmond, and H. Douglas Dahl, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 13, 1976, Ser. No. 714,065

Int. Cl.² E21B 49/00

U.S. Cl. 73—88 E **7 Claims**



7. A method of determining strength characteristics of a subterranean formation comprising the steps of:

a. forming a borehole into said formation;

b. applying uniform radial forces outwardly against the wall of said borehole in all directions except along a selected diameter of said borehole, thereby applying a higher parting force on said formation across the axial plane extending through said selected diameter;

c. determining the pressure required to generate microcracks in said formation at said plane, said determination being made by means of a sound pickup device; and

d. repeating steps (b) and (c) for at least one other selected diameter.

4,030,346
MAGNETOELASTIC TRANSDUCER ARRANGEMENT

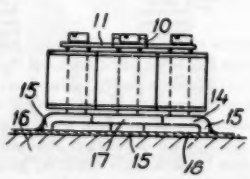
Orvar Dahle; Folke von Knorring, and Sture Siby, all of Vasteras, Sweden, assignors to ASEA Aktiebolag, Vasteras, Sweden

Filed Oct. 6, 1975, Ser. No. 619,803

Claims priority, application Sweden, Oct. 25, 1974, 7413444

Int. Cl.² G01B 7/24

U.S. Cl. 73—88.5 R **4 Claims**



1. In combination with a body having at least a part thereof of magnetic material, means for measuring mechanical stresses in the body, comprising four pins each having one end

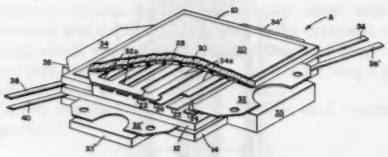
welded to the body and one end free, the pins being located at the corners of a substantially square surface area of the body, a first winding on at least one of the pins for generating a magnetic field in the body and a second winding on at least one pin adjacent to said first pin for sensing the changes in the field configuration which occur in the body when it is subjected to mechanical forces, yokes of magnetic material each connecting the free ends of each pair of diagonally placed pins to each other, said yokes being fastened to said free ends of the pins.

4,030,347

BIAXIAL CAPACITANCE STRAIN TRANSDUCER

Elwood B. Norris, and Lester M. Yeakley, both of San Antonio, Tex., assignors to Electrical Power Research Institute, Palo Alto, Calif.

Filed Oct. 31, 1975, Ser. No. 627,590
Int. Cl.² G01B 7/22
U.S. Cl. 73—88.5 R **26 Claims**



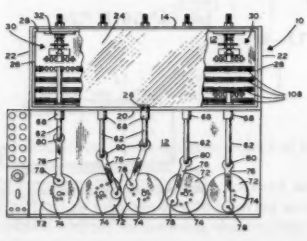
1. A multiaxial capacitance strain transducer comprising: a stack of at least three support wafers defining at least two slots therebetween, a first capacitance strain transducer formed in one of said slots including at least one capacitance varying element slidably carried in said one slot and extending outwardly therefrom, a second capacitance strain transducer formed in the other of said slots including at least one capacitance varying element slidably carried in said other slot and extending outwardly therefrom, said second capacitance strain transducer being angularly offset with respect to said first capacitance strain transducer by a predetermined angle and coupling means connecting the outwardly extending portions of said capacitance varying elements with the surface wherein strain is to be measured.

4,030,348

MACHINE FOR USE IN MONITORING FATIGUE LIFE FOR A PLURALITY OF ELASTOMERIC SPECIMENS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and George E. Fitzer, Arcadia, Calif.

Filed Jan. 29, 1976, Ser. No. 653,682
Int. Cl.² G01N 3/34
U.S. Cl. 73—91 **8 Claims**



1. An improved machine for use in determining the term of fatigue life for a plurality of elastomeric specimens simultaneously subjected to cyclic strain over a range of frequencies comprising:

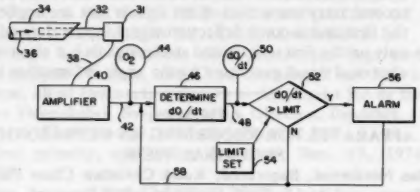
a. a plurality of test stations arranged in juxtaposition;
b. specimen support means located at each of said test stations for supporting in suspension a plurality of specimens of elastomeric materials; and
c. tensioning means arranged in coplanar relation with said specimen support means at each of said stations for periodically applying to the specimens supported at each of said stations tensile force of a magnitude suitable for cyclically subjecting the specimens to sinusoidal strain including means for selectively varying the amplitude of the strain to which the specimens are subjected at each of said stations, whereby monitoring of fatigue life over a range of strain amplitudes if facilitated.

4,030,349

ENGINE ANALYSIS APPARATUS

John David Blanke, Fullerton, and Norman Eliot Brunell, Sherman Oaks, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 16, 1976, Ser. No. 714,144
Int. Cl.² G01M 15/00
U.S. Cl. 73—116 **10 Claims**



1. Improved engine exhaust gas analysis apparatus comprising:

a. means for sampling the exhaust gases including means for generating a first signal indicating the amount of a component present in the exhaust gases;
b. differentiating means connected to said sampling means and including means responsive to said first signal for generating a second signal indicating the rate of change of said first signal with respect to time;
c. means connected to said differentiating means for comparing said second signal to a limit; and,
d. means connected to said comparing means for indicating when said second signal exceeds said limit.

4,030,350

APPARATUS FOR SIMULATING VARIABLE AIR PRESSURES

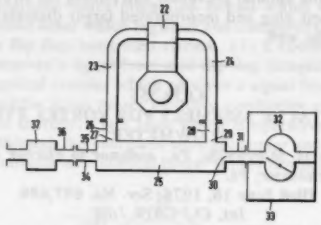
Manfred Bier, Weissach, Germany, assignor to Porsche AG, Germany

Filed Aug. 13, 1976, Ser. No. 714,178
Claims priority, application Germany, Aug. 13, 1975, 2536047
Int. Cl.² G01M 15/00
U.S. Cl. 73—117.1 **10 Claims**

1. In an apparatus for simulating variable air pressure, particularly for the analysis of the influence of variable air pressures on the exhaust emission, power output and fuel consumption of an internal combustion engine, said apparatus including a cansiter which has first and second openings respectively coupled to the exhaust port of the internal combustion engine and a vacuum pump withdrawing gases from said canister, and a third opening coupled with a variable throttle device for adjusting the flow of air into said canister,

the improvement wherein

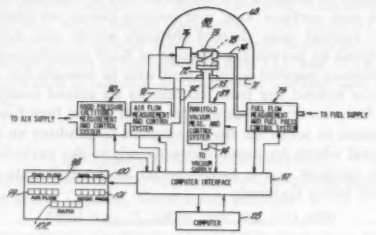
said canister is further provided with a fourth opening coupled to the air intake port of said engine, and wherein said variable throttle device is a self-regulating throttle device.



4,030,351
METHOD AND APPARATUS FOR LABORATORY TESTING OF CARBURETORS

Richard Lawrence Smith, Livonia, Mich., assignor to Scans Associates, Inc., Livonia, Mich.

Filed Nov. 17, 1975, Ser. No. 633,022
Int. Cl.² G01M *19/00*
U.S. Cl. 73—118 90 Claims

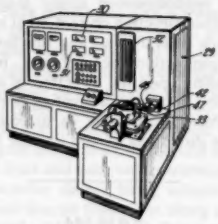


1. A method of testing carburetors at any desired number of points in the carburetor's operating range using subsonic flow to determine the air flow and fuel flow rate through the test carburetor, said method including the steps of providing a suitable test stand on which to mount a carburetor, providing a suitable test chamber above said stand adapted to sealingly enclose said carburetor, continuously controlling the pressure inside said test chamber with an optimized rate, reset and proportional control wherein the derivative time, reset time and proportional band values are continuously and automatically modified to be optimum so as to quickly produce the desired pressure at each point at which said carburetor test will take place in the shortest possible time, simultaneously controlling the pressure of the fuel entering the carburetor, simultaneously inducing air flow through said carburetor by providing a vacuum downstream of said carburetor, simultaneously determining the flow rate of air and fuel entering the carburetor, and simultaneously rotating the carburetor throttle plate until a desired predetermined test condition is achieved.

4,030,352
APPARATUS FOR REPRODUCING OPERATING CONDITIONS IN INDUCED FLOW DEVICES

Richard L. Smith, Livonia, and Peter J. Mosher, Northville, both of Mich., assignors to Scans Associates, Inc., Livonia, Mich.

Division of Ser. No. 483,320, June 25, 1974, Pat. No. 3,975,953. This application Jan. 12, 1976, Ser. No. 648,510
Int. Cl.² G01F *9/00*
U.S. Cl. 73—118 6 Claims

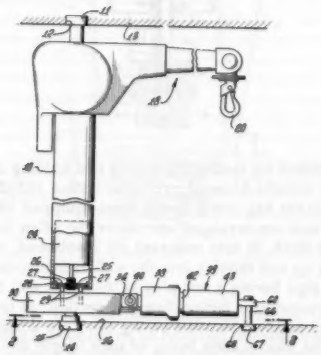


1. A carburetor throttle plate drive including a frame member, a stepping motor fixedly mounted to said frame member, a first non-linear driving means fixedly mounted to the shaft of said stepping motor, a second non-linear driven member rotatably mounted on said frame member in driving engagement with said driving means, and means mounted on said driven member adapted to drivingly but removably be connected to said carburetor to control the throttle plate thereof.

4,030,353
EFFORT LIMITING AND INTERRUPTING ACTUATOR

Donald P. Shutt, Long Beach, Calif., assignor to Western Gear Corporation, Lynwood, Calif.

Continuation-in-part of Ser. No. 554,509, March 3, 1975, Pat. No. 3,964,318. This application Apr. 12, 1976, Ser. No. 676,337
Int. Cl.² B66C *13/50*
U.S. Cl. 73—139 6 Claims



1. In a mechanical direction discriminating sensor: an input arm pivoted on a first relatively fixed pivot axis and adapted to be torqued in either direction about said axis,

a reaction arm comprised of two telescopically related arm members, one pivoted about a second relatively fixed axis, spaced from and parallel to that of said input arm, the second being pivotally connected to said input arm for pivotal movement about an axis spaced from and parallel to said second relatively fixed pivot axis,

a V-cam on at least one of said input arm and said second arm member, facing longitudinally therealong,

a plunger engaging in said V-cam, telescopically related to the respective one of said second of said telescopically related arm members of said reaction arm, and said input arm,

a pre-compressed compression spring means acting longitudinally of said input arm between said plunger and said input arm, said compression spring means having sufficient pre-compression to withstand a compressive force of a predetermined limited magnitude without longitudinal contraction, and thereby stiffen said input and reaction arms against angular break at the pivot connection therebetween, but to contract in response to compressive force of a predetermined larger magnitude owing to torque in either direction on said input arm, whereby said angular break of said input and reaction arms occurs at said pivot connection therebetween, in opposite directions depending upon the direction of said torque, and

sensor operating means on a pivoting portion of said reaction arm discriminatory by its direction of movement between the directions of said angular break.

4,030,354

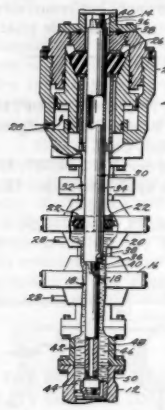
TESTING OF RAM AND ANNULAR BLOWOUT PREVENTERS

Kenneth F. Scott, 321 Woodmont, Gretna, La. 70053

Filed Feb. 27, 1976, Ser. No. 662,256

Int. Cl.² E21B *47/10*

U.S. Cl. 73—151 **5 Claims**



4. A method for testing the sealing and holding characteristics of an annular blowout preventer with a radially expansible-contractile bag and a casing rams-equipped blowout preventer, which are arranged one above the other in a blowout preventer stack, in turn mounted on a wellhead, comprising:

making up and running into the well until it seats a string of drill pipe having a test plug at the lower end thereof and incorporating a larger diameter section, of the diameter of the casing which the casing rams are designed to seal against, said section being of such length and placement in the string of drill pipe, that when the test plug seats in the wellhead the section is in position to be alternately circumferentially gripped by the casing rams and the bag of the annular preventer;

opening the annular preventer, closing the casing rams on said larger diameter section, introducing pressurized fluid into the annulus outside said string between the casing rams and the test plug, and monitoring for leakage from the annulus, of pressurized fluid;

opening the casing rams, closing the annular preventer on said larger diameter section, introducing pressurized fluid into the annulus outside said string between the annular preventer and the test plug, and monitoring for leakage of pressurized fluid from the annulus;

opening the annular preventer and pulling the string of drill pipe, test plug and incorporated larger diameter section from the well.

4,030,355

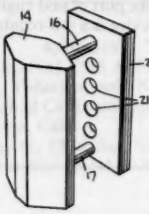
OBSTACLE ASSEMBLY FOR VORTEX TYPE FLOWMETER

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed June 18, 1976, Ser. No. 697,686

Int. Cl.² G01F *1/68*

U.S. Cl. 73—194 VS **7 Claims**



1. A vortex type flowmeter providing accurate flow rate readings regardless of turbulence or other disturbances in the fluid being metered, said flowmeter comprising:

A. a flow tube forming a conduit for the fluid to be metered;

B. an obstacle assembly disposed in said tube and constituted by a front section and a rear section, said front section being mounted across said tube at right angles to the longitudinal flow axis of said tube to intercept the incoming fluid whereby fluidic vortices are periodically shed therefrom, said rear section being disposed at right angles to said flow axis and being spaced from said front section to define a gap therebetween to trap and to stabilize said vortices, said rear section having an opening in the central zone thereof through which said flow axis extends to permit the passage of fluid therethrough in a direction parallel to said flow axis to smooth out turbulence behind the front section to an extent creating an orderly vortex trail down the center of the flow tube; and

C. means to sense the fluidic vortices to produce an output signal whose frequency corresponds to the periodicity of the vortices and is proportional to the flow rate of the fluid being metered.

4,030,356

CONTINUOUS WEIGHING MECHANISM FOR FLUIDS

Burton Kent Jaquith, Fort Lauderdale, Fla., assignor to Technical Industries, Inc., Fort Lauderdale, Fla.

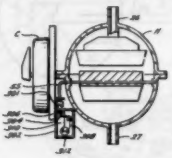
Filed Mar. 28, 1975, Ser. No. 563,093

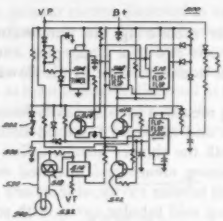
Int. Cl.² G01F *3/26;* A01J *5/00*

U.S. Cl. 73—195 **6 Claims**

1. A fluid flow indicating device for use with a conduit system wherein a fluid material is moved and is weighed by a continuous weighing mechanism, which contains a fluid receiver mounted upon a rocker shaft, said receiver and a portion of said rocker shaft contained within a housing which is supported by a frame, and comprising (a) a magnet which is detachably connected to said rocker shaft on that portion thereof which is outside said housing; (b) an electromechanical switch which is adapted to be mounted on said frame, said switch being in electromagnetic relationship with said magnet so that movement of said magnet can activate said switch; (c) a control module containing input an output circuits, disposed remotely from said switch and interconnected therewith by suitable electrically conductive means, and which control module consists of a solid state timing device which comprises

(1) a flow monitoring circuit which comprises two flip-flop integrated circuits for counting an incoming electrical signal; (2) a reference timer integrated circuit which comprises a comparative timer which registers and compares the signals of said two flip-flop integrated circuits; (3) a control transistor which receives a signal from said flip-flop integrated circuits; (4) an optical coupler which receives a signal from said control transistor upon preset circuitry conditions and which is energized thereby; (5) a triac which is operative via a pilot voltage through the energized optical coupler and which triac in turn activates an electrical power supply through the output





circuit and (6) an override section timer circuit which monitors the length of time between signals received in said flow monitoring circuit and upon preset circuitry conditions allows a greater lapse of time between said signals, and suitable electrically conductive means between items (1) and (6), said control module adapted to receive a signal from said switch through said input circuit and upon preset circuitry conditions, activate an outside electrical power supply through the said output circuit as described in item (5); and (d) a second housing which is adapted to detachably contain said control module.

4,030,357

METERING OF FLUID FLOWS

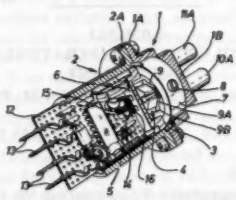
William Alexander Wemyss, Northwood, England, assignor to Litre Meter Limited, Northwood, England

Filed Aug. 3, 1976, Ser. No. 711,050

Claims priority, application United Kingdom, Aug. 5, 1975, 32668/75

Int. Cl.² G01F *1/075*, *5/00*

U.S. Cl. 73—202 **4 Claims**



3. Fluid flow-metering apparatus comprising a fluid flowmeter device and a conduit, wherein said flowmeter device comprises a casing defining a cylindrical chamber, a first end wall closing one end of said chamber, and inlet and an outlet for the fluid in said first end wall, a separately made ring of metal fitted non-rotatably in said chamber, two bearings at diametrically opposite positions in said ring, said ring having a cylindrical outer face and a cylindrical inner face and two diametrically opposite bores, the bearings being received within said bores, the cylindrical outer faces of said ring fitting in said cylindrical chamber, a rotor mounted on said bearings so that rotor axis is perpendicular to an intersects the axis of said ring, said rotor including radially-directed, axially-extending blades which are each substantially rectangular as seen in a direction perpendicular to the respective blade, one or more inductively detectable elements mounted in the tip or tips of one or more respective blades of the rotor, and two or more members made separately from said ring and partly filling the interior of said ring, each of said two or more members having a part-cylindrical outer face interfitting with a respective part of the cylindrical inner face of said ring, and a planar inner face facing the rotor and perpendicular to the axis of the rotor, a second end wall closing the other end of the chamber, a coil arranged in the vicinity of the second end wall, means sealing off the coil fluid-tightly from the chamber, said coil being adapted and arranged for sensing rotation of the rotor by sensing passage past the vicinity of the coil of said elements, and wherein said inlet and said outlet communicates with said conduit, the flowmeter device being adapted to produce a pressure difference due to fluid flow along said conduit between said inlet and said outlet such that a minor proportion of the fluid flowing along said conduit flows into and out of said chamber though said inlet and outlet while a major proportion of the fluid flowing along sid conduit bypasses said chamber, the ratio between said minor and major proportions being substantially fixed over a range of rates of flow of a given fluid along said conduit.

4,030,358

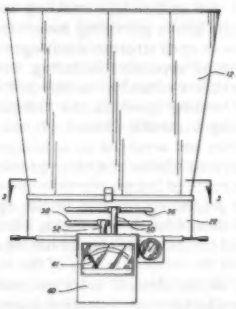
PORTABLE AIR VELOCITY MEASURING UNIT

Robert W. Noll, Santa Rosa, Calif., assignor to Cambridge Filter Corporation, Syracuse, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,419

Int. Cl.² G01F *1/00*, *1/46*

U.S. Cl. 73—212 **10 Claims**



1. A portable unit for measuring the velocity of an air stream flowing into or out of an opening, said unit comprising:

a. a wall section defining a path for air flow between first and second open ends;

b. at least two hollow manifold tubes, closed at both ends, extending transversely across said second open end of said wall section;

c. at least two hollow sensing tubes respectively mounted coaxially within said manifold tubes, and extending through one end thereof, each of said sensing tubes having a plurality of openings through the walls thereof within said manifold tubes for air flow between the interiors of said manifold and sensing tubes;

d. a first plurality of probes having open ends facing said first open end at preselected locations in a first plane

adjacent and transverse to said second open end, and communicating with the interior of one of said manifold tubes;

e. a second plurality of probes having open ends facing away from said first open end at preselected locations in second plane adjacent and transverse to said second open end, and communicating with the interior of the other of said manifold tubes, said second plane being closely adjacent to and closer to said second open end than said first plane, the number of said first probe open ends being equal to the number of said second probe open ends;

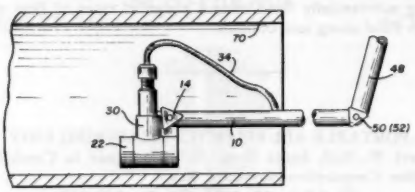
f. an air flow velocity meter having an inlet and an outlet, and means movable in proportion to the velocity of air flowing from said inlet to said outlet; and

g. means for selectively connecting either of said inlet and outlet in communication with either of said sensing tubes.

4,030,359
OPEN STREAM VELOCITY PROBE AND METER

W. Mead Stapler, One Dey Lane, Riverdale, N.J. 07457

Filed Nov. 26, 1976, Ser. No. 745,472
Int. Cl.² G01F 1/115
U.S. Cl. 73—231 R 7 Claims

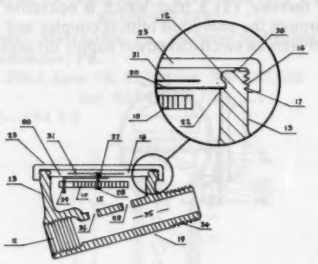


1. A flowmeter probe apparatus in which the probe is of a relatively small size and weight enabling hand holding and manipulation, said probe providing means for measuring the rate of fluid flow in open streams, discharge ends of pipes and the like, said probe apparatus including: (a) a turbine-type flowmeter in which a rotatable turbine has blades mounted thereon; (b) a housing in which the turbine is carried, this housing including a tubular shroud of not more than two inches in diameter and arranged so as to surround the tips of the rotatable turbine blades in a close proximity thereto and providing a clearance of not greater than one-eighth of an inch and to provide protection for said blades against accidental engagement of these blades with rocks, weeds, obstructions, walls of pipe and the like, said shroud having an inlet chamfer adapted to guide the influent in way of the wall of the shroud to the interior of the shroud; (c) a magnet carried by the turbine and producing in an induction transducer carried in the housing at least one pulse with every revolution of the turbine, this pulse carried by a cable to an amplifier and meter retained in a portable remote housing; (d) a pivot joint member formed on said housing; (e) a handle having a pivot mounting means on one end for the mounting thereon of the housing and a handle grip at the other end and a handle extension attachment means, the pivot mounting adapted for cooperative engagement with the pivot joint member on the housing; (f) means for locking and unlocking the pivot joint so that the housing may be moved and clamped at any position between alignment with the handle and at a position normal to the axis of the handle and when the housing is aligned with the handle placement of the probe into the ends of small discharge pipes may be achieved, and (g) a handle extension means pivotally attachable to the end of the handle enabling the housing and shroud to be inserted into a pipe while the operator stands above the pipe.

4,030,360
SHOWER WATER TEMPERATURE MEASURING INSTRUMENT

Jeffrey L. Fortune, 3901 40 St. South, St. Petersburg, Fla. 33711

Filed Dec. 18, 1975, Ser. No. 641,883
Int. Cl.² G01K 1/08, 13/02
U.S. Cl. 73—349 2 Claims



1. Apparatus for measuring the temperature of flowing water attached at one end to a water pipe and disposed upstream to a shower nozzle relative to the flowing water comprising:

a molded casing means, a tubular cavity formed within said casing means and disposed for fluid connection of the water pipe with the shower nozzle, a first cavity formed within said casing means and disposed in spaced apart relation to said tubular cavity, at least one passage means interconnecting said tubular cavity with said first cavity, bimetal coil means with a bimetal coil disposed within said first cavity with the bimetal coil directly in fluid communication through said passage means with the flowing water, said bimetal coil means including a first and second end, connector means for mounting said first end of said bimetal coil within said first cavity shaft means attached to said second end, pointer means attached to said shaft means whereby rotation of said shaft means caused by coiling and uncoiling of said bimetal coil means rotates said pointer means, lens means disposed in water sealing attachment to said causing means, dial plate means disposed within said first cavity in spaced-apart relation to said lens means, said pointer means positioned between said dial plate means and said lens means, hollow bearing means disposed within said dial plate means and configured to receive said shaft means, said shaft means disposed in protruding relationship within said hollow bearing means, whereby said bimetal coil means coils and uncoils in response to variation in temperature of the flowing water, whereby said lens means is easily viewable to the user.

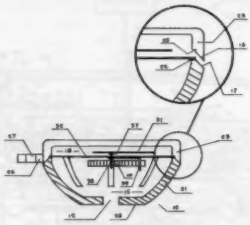
4,030,361
FLOATING BATH WATER TEMPERATURE MEASURING INSTRUMENT

Jeffrey L. Fortune, 3901 40th St. South, St. Petersburg, Fla. 33711

Filed Dec. 22, 1975, Ser. No. 643,535
Int. Cl.² G01K 1/08
U.S. Cl. 73—353 5 Claims

1. A floating apparatus for measuring the temperature of water contained within an open vessel while floating on the surface of the water comprising: casing means with a hemispheric shape, said casing means having a first cavity formed therein, said casing means having at least one passage means through the wall thereof whereby said first cavity means is open to the flow of water, coil means including a first end and a second end disposed within said first cavity and attached at the first end to the wall of said first cavity, shaft means attached to the second end of said coil means, dial plate means

disposed in water sealing engagement with the lip of said casing means, lens means disposed in water sealing attachment to the lip of said casing means, a second cavity means formed between said dial means and said lens means whereby said second cavity means is sealed from the flow of water, hollow bearing means connecting said first cavity with said second cavity and configured to receive said shaft means, said shaft means disposed in protruding relation to said hollow



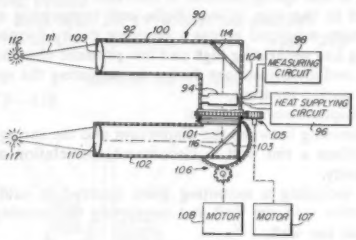
bearing means, pointer means disposed in substantially spaced apart parallel relation to said dial plate means and attached to said shaft means, the upper portions of said passage means positioned near the lip of said casing means whereby said passage means at least in part is disposed at the top of said first cavity when said floating apparatus is merged in water, whereby said shaft caused by coiling and uncoiling of said coil means rotates said pointer.

4,030,362

SELF-CALIBRATING RADIOMETER

John Dimeff, 5346 Greenside Drive, San Jose, Calif. 95127

Filed Dec. 22, 1975, Ser. No. 643,042
Int. Cl.² G01J *5/52*
U.S. Cl. 73—355 EM **2 Claims**



1. A self-calibrating radiometer comprising:

first means forming a block having a front surface for receiving incident radiation flux, an identically configured rear surface for receiving internally applied heat and a mid portion for thermally insulating said rear surface from said front surface, said front surface being capable of absorbing as heat substantially all radiation flux incident thereupon and capable of reradiating substantially all of the absorbed heat, and said rear surface being capable of radiating substantially all heat applied thereto;

second means for sensing the heat radiated by each of said front and rear surfaces and for indicating any difference therebetween;

third means for applying enough heat to said rear surface so that no difference in heat radiated by said front and rear surfaces is indicated by said second means;

fourth means for measuring the heat applied to said rear surface, such measurement being indicative of the radiant flux incident on said front surface;

fifth means for focusing first radiation flux from a first external source upon said front surface;

sixth means for focusing second radiation flux from a second external source upon said rear surface; and

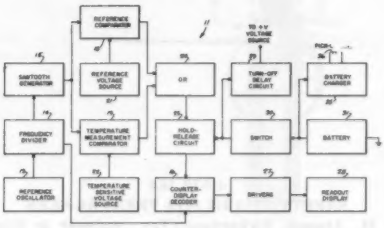
housing means enclosing said block and isolating said rear surface from said first external flux and isolating said front surface from said second external flux.

4,030,363

ELECTRONIC THERMOMETER

Michael E. Halleck, Boulder, Colo., assignor to Electromedics, Inc., Denver, Colo.

Filed Oct. 28, 1975, Ser. No. 626,364
Int. Cl.² G01K *7/24;* **H03K** *13/02*
U.S. Cl. 73—362 AR **2 Claims**



1. In an electronic thermometer having means for displaying a patient's temperature, an activation switch, means responsive to said patient's temperature for generating an analog temperature measurement signal, means for generating an analog reference signal, and means comparing said analog temperature measurement signal with said analog reference signal for controlling said display means, an improvement to said controlling means comprising:

oscillator means for generating a plurality of clock pulses;

frequency divider means responsive to said clock pulses for generating a first series of timing pulses and for generating a second series of timing pulses;

saw tooth generator means operative upon receipt of each timing pulse of said first series of timing pulses for producing a saw tooth pulse;

first comparator means, simultaneously receptive of each said saw tooth pulse and of said analog reference signal, for outputting a first control signal when the amplitude of said saw tooth pulse equals the amplitude of said analog reference signal;

second comparator means, simultaneously receptive of each said saw tooth pulse and of said analog temperature measurement signal, for outputting a second control signal when the amplitude of said saw tooth pulse equals the amplitude of said analog temperature measurement signal;

counting means responsive to said second series of timing pulses for counting timing pulses of said second series, the number of said counted pulses being related to the temperature displayed by said display means;

activating means, cooperative with said counting means and responsive to said first and second control signals and the number of said counted pulses, for activating said display means to display a temperature;

said activating means being responsive to said first control signal when the amplitude of said analog temperature measurement signal is less than the amplitude of said analog reference signal for activating said display means to display a calibration temperature, and

said activating means being responsive to said second control signal when the amplitude of said analog temperature measurement signal is greater than the amplitude of said analog reference signal for activating said display means to display a measured temperature of said patient;

adjustment means for adjusting the frequency of generation

of clock pulses by said oscillator means to adjust the calibration temperature displayed to a preselected desired calibration temperature; and

presenting means responsive to the release of said activation switch for presenting only the last reading to said display means for a predetermined time interval, wherein said presenting means comprises a capacitor responsive to the activation of said activation switch for charging up to a supply voltage value and a discharge circuit responsive to said charged capacitor for supplying power to said controlling means after said activation switch is released.

4,030,364

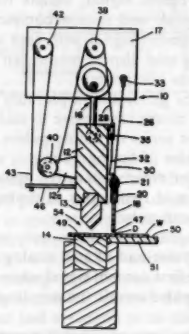
SAFETY GUARD FOR PRESS BRAKES

Felix M. Atwood, Richardson, Tex., assignor to Square D Company, Park Ridge, Ill.

Filed May 20, 1976, Ser. No. 688,436

Int. Cl.² B21D *55/00*; F16P *3/00*

U.S. Cl. 72—389 **9 Claims**



1. A safety guard for use with a press brake or the like having a supporting structure, a bed fixed with respect to and below at least a portion of the supporting structure, and a ram carried by the supporting structure, and reciprocable in a path between an uppermost position above the bed through a workpiece-engaging position to a lowermost position after performing a fabricating operation on a workpiece positioned on the bed, said safety guard comprising a protective sheet disposed, when the ram is in its uppermost position, in a guarding position with respect to the path of reciprocation of the ram and with a lower edge of the sheet positioned a predetermined distance above an upper surface of the bed thereby to define an opening of sufficient width to permit a workpiece to be passed through the opening onto the bed but of insufficient width for passage of an operator's hand, and means drivingly connecting the ram to the sheet for starting upward movement of the sheet to widen the opening only when the ram nears the bed during the downward portion of its stroke and continuing to move the sheet upwardly to a maximum displacement from the upper surface of the bed when the ram is at its lowermost position thereby to permit manipulation of the workpiece during its fabrication by the ram, said means effecting a return movement of the sheet to its initial position as the ram returns to its uppermost position.

4,030,365

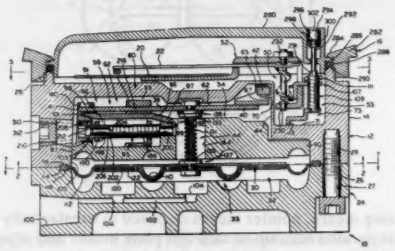
DIFFERENTIAL PRESSURE GAUGE

James W. Phillips, and Terrance J. Troyer, both of Michigan City, Ind., assignors to Dwyer Instruments, Inc., Michigan City, Ind.

Continuation-in-part of Ser. No. 639,969, Dec. 11, 1975, Pat. No. 4,011,759. This application June 28, 1976, Ser. No. 700,131

Int. Cl.² G01L *7/08*

U.S. Cl. 73—393 **17 Claims**



1. In a gauge that includes linear to rotary motion transforming means including a housing, a helix in the housing journaled for rotation about its axis, with the helix having an indicator connected thereto, a magnet in the housing for producing rotational movement of said helix in response to linear movement of the magnet alongside the axis of the helix, said magnet being mounted on a leaf spring member secured within the housing cantilever fashion at one end of said spring member, with said spring member being disposed to extend generally transversely of the axis of said helix and with said helix aligned with said spring member, said magnet being mounted on said leaf spring member adjacent to and in magnetic attraction relation to said helix, sensing means connected to said spring member to shift said magnet substantially parallel to the axis of said helix and comprising a flexible diaphragm mounted across a pressure cavity formed by the housing and separating high and low pressure chambers in the gauge, and an adjustment device for adjusting the spring rate of said spring member,

the improvement wherein:

the housing between the diaphragm and the spring member defines a rim wall in circumambient relation about the cavity,

and including a mounting plate secured in said housing within said rim wall and contacting the housing only at said rim wall,

said leaf spring member being mounted on said mounting plate at said one end of said spring member and the magnet being adjacent the other end of said spring member,

a fulcrum for said spring member engaging said spring member intermediate said ends of said spring member and mounted on said mounting plate for adjustment longitudinally of said spring member,

and means for moving said fulcrum longitudinally of said spring member.

4,030,366

PRESSURE TRANSMITTER

Masahiro Kazahaya, Southampton, and John J. Bonner, Philadelphia, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa.

Filed Aug. 11, 1976, Ser. No. 713,623

Int. Cl.² G01L *7/08*

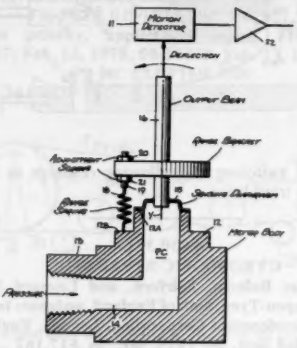
U.S. Cl. 73—406 **7 Claims**

1. In a pressure transmitter in which fluid pressure is indicated by a sensor to produce a corresponding deflection which

is converted into a signal for transmission to a remote station, said sensor comprising:

A. a meter body having a chamber therein which is coupled to the fluid whose pressure is to be transmitted;

B. a diaphragm sealing said chamber whereby the diaphragm is caused to dilate axially as a function of applied fluid pressure;



C. an upstanding force beam anchored on said diaphragm whereby said dilatable diaphragm seeks to push said beam upwardly; and

D. a range spring which is offset with respect to the axis of said beam and is connected between an intermediate point on the beam and said body whereby when said beam is pushed by said diaphragm, it is caused to deflect.

4,030,367

DEVICE FOR CORRECTING THE LAW OF DEFLECTION OF AN ANEROID CAPSULE

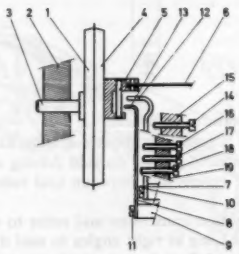
Roger Dussartre, Versailles, France, assignor to Jaeger, Levallois-Perret, Fraace

Filed Mar. 19, 1976, Ser. No. 668,397

Claims priority, application France, Apr. 24, 1975, 75.12866

Int. Cl.² G01L *7/06*

U.S. Cl. 73—410 **1 Claim**



1. A device for correcting the law of deflection of an aneroid capsule sensitive to differential pressure, the device comprising an active diaphragm and at least two flexible strips of different rigidity, each having an end attached to a fixed frame of the device and a free end, the free ends of the strips being located at various points of a path covered by the central part of the active diaphragm of the aneroid capsule during its deflection, so that each free end constitutes an abutment for said central part when the central part reaches said free end, and wherein there is provided for at least one of said strips, abutments of adjustable length mounted on the fixed frame and located at various points in the region of displacement of said latter strips.

4,030,368

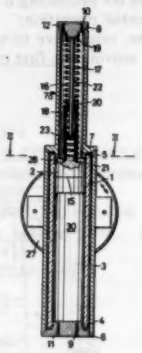
SPRING-LOADED DIFFERENTIAL PRESSURE GAGE

Hans-Jürgen Runge, Kisdorf, Germany, assignor to Warner Lewis Jr. Industrie- Filter GmbH, Frankfurt am Main, Germany

Filed Aug. 11, 1976, Ser. No. 713,449

Int. Cl.² G01L *13/02*

U.S. Cl. 73—419 **20 Claims**



1. A differential pressure gage, comprising a hollow cylinder; a piston reciprocably received in and dividing the interior of said cylinder into a low-pressure and a high-pressure chamber, said piston and said cylinder consisting of materials having at least substantially identical heat expansion coefficients; and means for biasing said piston in a direction to reduce the volume of one of said chambers, comprising a plurality of tension springs arranged in series and including a relatively weak first spring which is subjected to progressively increasing stresses only during a first stage of movement of said piston counter to said direction and a relatively strong second spring which is subjected to progressively increasing stresses substantially only during a next-following second stage of movement of said piston counter to said direction.

4,030,369

AUTOMATIC CONTROL SYSTEM FOR VACUUM LOOP SAMPLE INJECTION SYSTEM

Jay D. Etheridge, Sand Springs, Okla., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 668,780, March 19, 1976. This application Sept. 30, 1976, Ser. No. 728,491

Int. Cl.² G01N *1/22*

U.S. Cl. 73—422 GC **13 Claims**

1. In a vacuum loop sample injection system for injecting a predetermined amount of sample material from at least one sample source into a system for analyzing the sample, said injection system comprising,

a. a vacuum source;

b. at least one enclosure means having a predetermined volume;

c. means for detecting the pressure within the enclosure means and for producing a signal related to the pressure detected;

d. a source of carrier gas;

e. first connecting means having a first inlet port connected to the vacuum source, a second inlet port connected to the sample source, and an outlet port, said first connecting means having a first position wherein its first inlet port is in fluid communication with its outlet port, and a second position wherein the second inlet port is in fluid communication with its outlet port; and

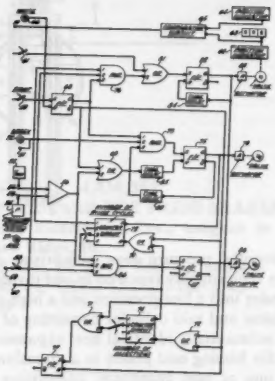
f. second connecting means having a first position wherein the enclosure means is connected to the outlet port of the first connecting means and a second position wherein the

enclosure means is placed in series with the carrier gas source and the sample analyzer system so that the carrier gas forces the sample isolated in the enclosure into the analyzing system;

an improvement for automatically controlling the two connecting means for sequential operation of the injection system, wherein the sequential control system comprises:

g. means for producing a command signal for initiating the sequential operation;

h. means, responsive to said command signal, for sequentially moving the first connecting means in a cyclic fashion from the first to the second position and back to the first position for a predetermined number of cycles, each cycle being complete upon the first connecting means reaching its second position, so that the enclosure means is rinsed out with sample material;



i. means, responsive to the completion of a predetermined number of cycles of the first connecting means, for moving the second connecting means from its first position into its second position, wherein the sample material in the enclosure means is injected into the sample analyzer system by the flow of carrier gas through the enclosure means.

4,030,370

TRANSDUCER POSITIONER FOR TESTING TUBES FROM INSIDE DIAMETER

Thomas R. Keith, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 25, 1976, Ser. No. 661,192

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.8 S **6 Claims**

1. A transducer positioner for testing conduits from the interior using a pulse-echo ultrasonic instrument comprising

a. a detection head comprising

1. flat, leaf-type springs connected in a cup-shaped arrangement,

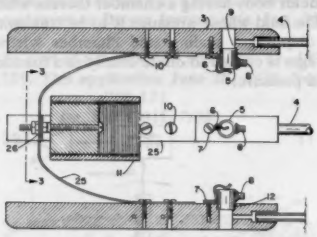
2. said springs supporting transducer shoes, having,

3. a transducer attached to said shoe, said transducer being exposed to water coupling means with the conduit to be tested,

b. connecting tubes between a water source and shoes to provide a water column for coupling each transducer to the conduit to be tested,

c. a switching box and a calibration transducer,

d. connecting cables from each transducer to an ultrasonic instrument, said cables passing through said switching box, said switching box allowing readings to be taken from any transducer.



4,030,371

GYROSCOPIC APPARATUS

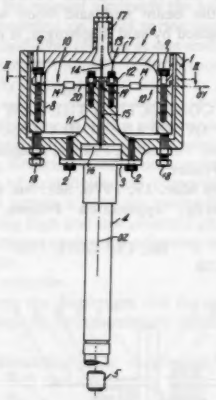
David Nicholas Bulman, Fairford, and Leonard Maunder, Newcastle-upon-Tyne, both of England, assignors to National Research Development Corporation, London, England

Filed Sept. 26, 1975, Ser. No. 617,162

Claims priority, application United Kingdom, Oct. 9, 1974, 43743/74

Int. Cl.² G01C *19/02*

U.S. Cl. 74—5 F **8 Claims**



1. Gyroscopic apparatus in which:

a driving element is rotatable about a driving axis;

a rotor has its center of gravity on said driving axis;

there is an elastic connection between said rotor and said driving element;

said elastic connection constrains said rotor to rotate normally in a plane lying at right angles to said driving axis, but permits it to deflect from said plane against elastic resistance;

said elastic connection includes a plurality of similar structures joining said rotor to said driving element and capable of exerting torque upon said rotor when deflected;

said structures each comprise a mass, a first member connecting said mass to said driving element and a second member connecting said mass to said rotor;

said first and second members are resilient in directions substantially parallel to said driving axis, whereby said masses have freedom to move in similar directions against elastic restraint; and

said restrained movement of said masses results in variation of said torque exerted by said structures upon said rotor when deflected, whereby at certain rotor speeds the resul-

tant of said torques substantially compensates for any other external torques to which said rotor is subject.

4,030,372

DRIVING METHOD FOR TANGENTIAL BELT AND APPARATUS THEREFOR

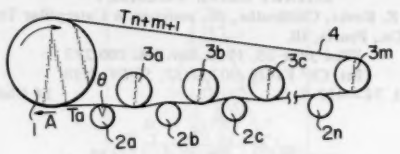
Noriaki Miyamoto, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Feb. 21, 1975, Ser. No. 551,765

Claims priority, application Japan, Feb. 27, 1974, 49-23107; Feb. 13, 1975, 50-17379; Feb. 13, 1975, 50-17380

Int. Cl.² F16H *7/00*

U.S. Cl. 74—221 **8 Claims**



1. An apparatus for driving a plurality of driven pulleys or pairs of driven pulleys, wherein said apparatus comprises an endless belt tangentially contacting said driven pulleys, a driving pulley for driving said endless belt, a plurality of driven pulley means each including from one to two driven pulleys mounted to be driven by said endless belt, and a plurality of guide pulleys positioned intermediate said pulley means to press against said endless belt so as to bring it into contact with said driven pulley means at given contact angles, comprising means for setting said contact angles between said endless belt and the driven pulley means, so that said contact angles on all of said pulley means are progressively decreased toward the down stream direction of movement of the belt.

4,030,373

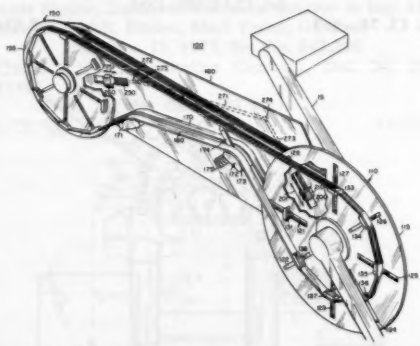
VARIABLE SPEED DRIVE FOR A BICYCLE

Hamlin Leonard, Darien, Conn., assignor to B-5 Associates of Stamford, Connecticut, Stamford, Conn.

Filed Nov. 20, 1975, Ser. No. 633,862

Int. Cl.² F16H *55/54, 9/00, 7/12, 55/30*

U.S. Cl. 74—230.19 **18 Claims**



1. A variable speed drive for a bicycle, comprising:

a variable diameter driving mechanism rotatably mountable on said bicycle, said mechanism including a mounting plate having a plurality of radial tracks therein;

a plurality of movable sheave elements each being mounted in one of said tracks, each sheave element having a releasable retaining means which normally retains it at a substantially fixed radial position in its track;

flexible driving means partially wrapped around said driving mechanism and engaging different adjacent ones of said sheave elements depending on the rotational orientation of said driving mechanism;

gate means positioned to sequentially coact with the non-engaged sheave elements and operative, under manual control, to release the retaining means of a sheave element to allow radial motion of said sheave element; and

means for applying a radial bias to the released sheave elements.

4,030,374

FRONT DERAILLEUR FOR BICYCLE

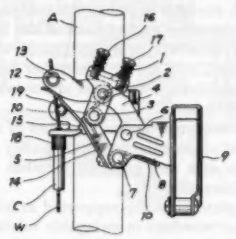
Mitsuhide Isobe, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Dec. 15, 1975, Ser. No. 640,790

Claims priority, application Japan, Dec. 12, 1974, 49-143966; Dec. 12, 1974, 49-143967

Int. Cl.² F16H *7/22, 11/08*

U.S. Cl. 74—217 B **5 Claims**



1. A front derailleur for a bicycle for shifting a driving chain to one of two or more sprocket wheels of a front gear, said derailleur comprising:

a fixing member secured to a bicycle frame;

two linkage members pivotally connected to said fixing member;

a chain guide pivotally connected to one end of each of said linkage members, said chain guide being laterally movable with respect to said fixing member through said linkage members to thereby guide the driving chain to be shifted;

return springs for biasing said chain guide;

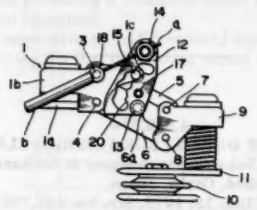
an arm pivotally connected at one end thereof to said fixing member and having one end of a Bowden wire fixed to the other end thereof, said arm extending from said one end thereof in a direction away from said linkage members to the other end thereof;

a leaf spring for transmitting the movement of said arm to said linkage members, one end of said leaf spring being secured to one of said arm and one of said linkage members and the other end of said leaf spring being in abutment with the other one of said arm and said one linkage member so that said leaf spring is movable with said arm, said leaf spring having an elastic force which is greater than that of said return springs whereby when resistance below a predetermined amount is applied to the guide frame the leaf spring transmits the movement of the arm to the linkage members to move the guide chain laterally and when resistance above the predetermined amount is applied to the guide frame the leaf spring is deformed and can not transmit the movement of the arm to the linkage members and stores the energy from its deformation to thereafter transmit the movement of the arm to the linkage members to move the guide frame laterally after the resistance goes below the predetermined amount.

4,030,375
DERAILLEUR FOR BICYCLE

Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Mar. 31, 1976, Ser. No. 672,528
Claims priority, application Japan, Apr. 9, 1975, 50-43619
Int. Cl.[2] F16H 7/22, 7/00, 7/06
U.S. Cl. 74—217 B 15 Claims



1. A derailleur for a bicycle, which is adapted to change the bicycle speed by shifting a drive chain to one sprocket of a freewheel by means of a pull of a control wire, comprising:

a. a first fitting member, second and third linkage members pivoted at one end of the fitting member respectively, and a fourth movable member rotatably supported at its one end to the other end of each of the linkage members,

said linkage members being swingable with respect to said fitting member, said movable member being swingable with respect to said linkage members and movable with respect to said fitting member,

b. cages connected to the other end of said movable member, said cages carrying guide pulley means and moving together with said movable member to guide said drive chain therewith,

c. a cam plate pivotally supported at its one end to one of said four members in swingable relation therewith,

said cam plate having a cam face of a plurality of notches and a retainer attached to the other end opposite to said pivoted one end of the cam plate for retaining a terminal of the control wire, and

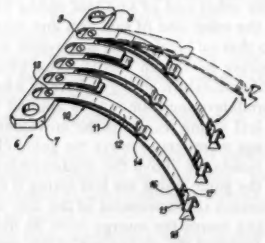
d. a pin fixed to a member, movable relative to said one member pivotally supporting said cam plate among said four members,

said pin being movable into contact with said cam face to be engaged with said notches respectively.

4,030,376
DEVICE FOR APPLYING TENSION TO BELTS OR CABLES FOR A REMOTE MANIPULATION

Jean-Claude Baudoin, Paris, and Robert Oger, Antony, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 20, 1976, Ser. No. 659,709
Claims priority, application France, Mar. 6, 1975, 75.07086
Int. Cl.[2] F16H 7/12, 7/10
U.S. Cl. 74—242.11 C 6 Claims

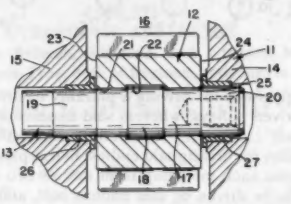


1. A device for applying tension to belts or cables for a remote manipulator and comprising a spring system mounted on a supporting bar which can be rigidly fixed to an element of the remote manipulator, a spring system continuously applied against the belts or cables with a substantially constant force in order to take up the slack of said belts or cables, said spring system being provided with a series of parallel elements equal in number to the belts or cables to be tensioned, each element being provided with an auxiliary spring-leaf applied against a main spring-leaf having a bridge-piece fitted at the end of said main spring-leaf and mounted astride the corresponding belt or cable.

4,030,377
ROTARY DRIVE ASSEMBLY

Frank E. Keske, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 28, 1976, Ser. No. 700,273
Int. Cl.[2] F16H 1/02, 1/12, 55/04, 1/38
U.S. Cl. 74—412 R 14 Claims



1. A rotary drive assembly comprising:

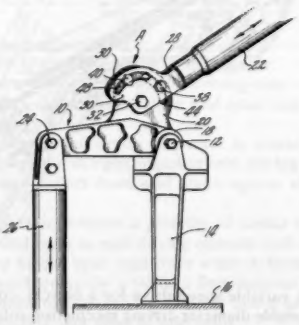
a pinion having an axial bore having opposite ends and defining an annular recess intermediate said ends; and

a shaft coaxially mounting said pinion and having an axially inner annular enlargement projecting into said bore and outer portion at axially opposite sides of said enlargement fitted in said bore axially outwardly from said recess.

4,030,378
REDUNDANT PUSHROD-TO-BELLCRANK CONNECTION

Edward James Kroesser, Milford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 11, 1976, Ser. No. 666,112
Int. Cl.[2] G05G 1/04
U.S. Cl. 74—469 8 Claims



1. In an aircraft control system, a bellcrank member, a rod member, a primary pivot connecting one end of said rod member to said bellcrank member, secondary pivot means connecting said members comprising bearing means concentric with and spaced radially from said primary pivot, said bearing means including at least two spaced sets of aligned

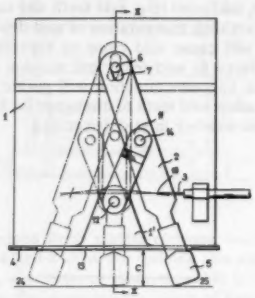
holes and arcuate slots in said members and pivot means extended through each set.

4,030,379

LEVER OPERATED CONTROL DEVICE

Andre Colinet, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Hauts de Seine and Automobiles Peugeot, Paris, both of, France

Filed Apr. 22, 1975, Ser. No. 571,000
Claims priority, application France, May 2, 1974, 74.15219
Int. Cl.² G05G *1/04*
U.S. Cl. 74—522 **7 Claims**



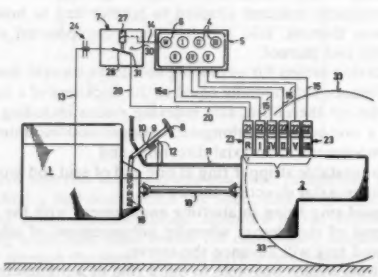
1. In a lever operated control mechanism wherein a control portion lies adjacent to and is adapted to move parallel to a control panel, a control device comprising: an elongated control lever having a first end and a second end; a control portion at the first end of said control lever; a restraining lever; first pivot means for pivotally mounting one end of said restraining lever on a movable axis located on said control lever between said first and second ends; second pivot means for pivotally mounting the other end of said restraining lever on a fixed axis; and limiting means at the second end of said control lever for limiting movement of said control lever to simultaneous pivotal movement about its second end and longitudinal movement.

4,030,380

SAFETY GEAR CHANGE APPARATUS FOR SNOW CLEARING VEHICLES

Werner Mutter, Todtmoos, Germany, assignor to Ing. Alfred Schmidt GmbH, Blasien, Black Forest, Germany

Filed Dec. 19, 1975, Ser. No. 642,500
Claims priority, application Germany, Dec. 24, 1974, 2461421
Int. Cl.² B60K *41/22*
U.S. Cl. 74—866 **12 Claims**



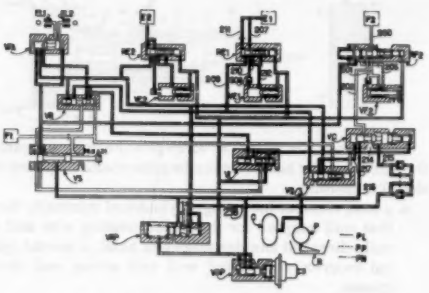
1. In transmission apparatus for use in snow clearing vehicles having a plurality of forward gears, a reverse gear and a control circuit for selectively engaging one of said plurality of forward gears or said one reverse gear, a safety gear change mechanism for avoiding damage thereto by an obstacle in the path of travel of the vehicle, comprising a preselection control circuit electrically connected to the control circuit of said vehicle for automatically placing said control circuit in a state that shifts the vehicle into said reverse gear, in response to a given stimulus for a time sufficient to assure clearance of the vehicle from the obstacle.

4,030,381

HYDRAULIC CONTROL DEVICE FOR AUTOMATIC CHANGE-SPEED TRANSMISSIONS

André Lalin, and Jean Piret, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed June 3, 1976, Ser. No. 692,354
Claims priority, application France, June 4, 1975, 75.17369
Int. Cl.² B60K *21/00*
U.S. Cl. 74—867 **12 Claims**



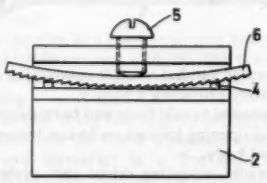
1. Hydraulic control device for automatic change-speed transmissions, especially for motor vehicles, which comprises a fluid reservoir, a pump supplied from said reservoir, a main pressure regulation valve determining the line pressure of the device and supplied from said pump, a hydraulic circuit connected to said main pressure regulation valve and feeding a series of hydraulic receivers through an assembly of auxiliary regulation valves associated with time-lag means, respectively, one of said valves being supplied through a cut-off valve, said device further comprising at least one delivery conduit supplying fluid to a group of hydraulic elements mainly consisting of a flap valve and a gauged orifice connected in parallel.

4,030,382

SHARPENING DEVICE FOR STEEL SKI EDGE STRIPS

Sven A. Nilsson, and Christian Melin, both of Eskilstuna, Sweden, assignors to C O Oberg & Co AB, Eskilstuna, Sweden

Filed Mar. 1, 1976, Ser. No. 662,548
Int. Cl.² B21K *17/00*
U.S. Cl. 76—83 **3 Claims**



1. A sharpening device particularly for sharpening steel edge strips on skis and comprising a generally U-shaped holder for a generally straight blade with one longitudinal

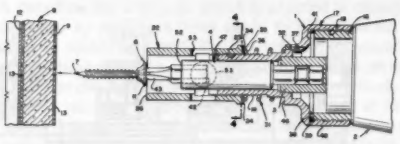
edge projecting from the holder and clamping means for securing the file blade to the inside of a first U-shank, the latter having a guide flange depending substantially at right angles therefrom, the improvement being the provision of two spaced supports for the file blade, at the inside of said first U-shank, said clamping means being a clamping screw received by a second U-shank and being located between said supports to cause upon actuation the bending of the file blade into a convex shape abutting said first U-shank between said supports.

4,030,383

NOSE PIECE FOR SCREWGUNS

John Bradley Wagner, 389 Montecillo Court, Walnut Creek, Calif. 94595

Filed June 30, 1976, Ser. No. 701,235
Int. Cl.² B25B *13/00*
U.S. Cl. 81—54 **7 Claims**



1. A nose piece for a screwgun having an externally threaded annular head surrounding the rotatable power driven shaft comprising:

a. a base member including a cylindrical internally threaded first wall adapted for threadably mating with said externally threaded annular screwgun head, a second cylindrical externally threaded wall and spring end receiving means;

b. a cylindrical nose piece member having a portion internally threaded for threadably mating with said second cylindrical threaded wall of said base member, a spring retaining planar annular surface presented toward said base member and a planar annular face adapted for engaging a work surface; and

c. a spring coaxially surrounding said second wall of said base member having a first end engaging said spring receiving means on said base member and having a second end slidably engaging said spring retaining planar annular surface and biasing said base member and nose piece members away from one another.

4,030,384

RATCHET WRENCH

David P. Newman, P.O. Box 295, yellow Springs, Ohio 45387

Filed Aug. 9, 1976, Ser. No. 712,510
Int. Cl.² B25B *13/00*
U.S. Cl. 81—58.3 **8 Claims**

1. A hand operated ratchet wrench comprising an

an elongated body providing a handle,

a driver ring fastened to said body and having opposite faces and a circular opening located on an axis transverse to the length of said body,

a circumferentially extending driver cam projecting from one face of said driver ring,

a socket member having an outer circular configuration matched to said opening and an inner configuration of irregular shape,

said socket member being rotatably fitted within said driver ring,

a series of driven teeth on said socket member having tooth faces formed with a slope opposite to said driver cam and located facing toward but spaced from said driver cam,

a pawl ring surrounding said socket member and having a circumferentially extending driven cam engaged with said driver cam on said driver ring,

said pawl ring also having a series of driving teeth engageable with said driven teeth,

said cams having a rise greater than the depth of said teeth,

and a retainer on said socket member extending in opposed relation to the other face of said driver ring,

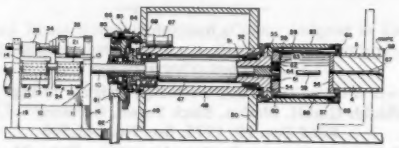
said retainer, said pawl ring, said teeth and said cams being spaced apart such that rotation of said driver ring in one direction will cause said cams to separate and impart engaging force to said teeth and rotation of said driver ring in the opposite direction will permit said cams to close and allow said teeth to disengage for free rotation of said socket member in said driver ring.

4,030,385

WASHER CUTTING MACHINE

Harold W. Scholin, Park Ridge, and Hieronim L. Lisiecke, Chicago, both of Ill., assignors to Scholin Industries, Inc., Chicago, Ill.

Filed Dec. 15, 1975, Ser. No. 640,636
Int. Cl.² B23B *7/00, 3/04*
U.S. Cl. 82—48 **14 Claims**



1. A machine for cutting a plurality of washers, or the like, successively from a sleeve of suitable elastomeric material, comprising,

a. a rotatable mandrel adapted to receive and to hold the sleeve thereon, said mandrel being unsupported at the outer end thereof,

b. indexing means for advancing the sleeve on said mandrel a distance substantially equal to the thickness of a washer to be cut therefrom, said indexing means including

1. a non-rotatable elongated stripper rod mounted for movement in an axial direction, and

2. a rotatable stripper ring at one end of said rod movable in an axial direction therewith,

3. said ring being in abutting engagement with the inner end of the sleeve, whereby advancement of said rod and ring will advance the sleeve,

c. cutting means operable to cut a ring of a predetermined width from the outer end of the sleeve beyond the end of said mandrel,

d. means for rotating said mandrel and sleeve, and

e. actuating means for operating said indexing means upon completion of a cutting operation.

4,030,386

TWIN-EDGED FOAM PLASTIC CLEAVING MACHINE

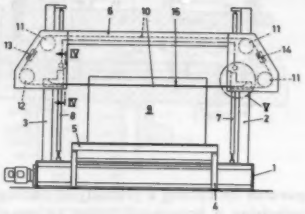
Rolf Poetzsch, and Hans Gunther Schuster, both of Freudenberg, Germany, assignors to Albrecht Baumer KG Spezialmaschinenfabrik, Germany

Filed July 11, 1975, Ser. No. 595,081

Claims priority, application Germany, July 16, 1975, 2434050

Int. Cl.² B26D *3/28*

U.S. Cl. 83—4 11 Claims



1. A twin-edged foam plastic cleaving machine having a machine frame and a drive for guiding and adjusting a band blade support, a workpiece table, movable in relation to the machine frame, for receiving the block of foam plastic to be cut; a twin-edged band blade arrangement, and a truss which is disposed on the side of the band blade remote from the block of foam plastic and which supports the band blade against yielding both due to a tensile force exerted on the band blade and also due to the reaction compressive force wherein the truss is pivotably mounted and can be pivoted out of the neutral position in the range of ±10° of arc in dependence on the thickness of the block to be cut wherein at each of the two ends of the truss a bearing and supporting member is provided which has an aperture for the band blade arrangement and the truss and is mounted via a rotary thrust bearing on the band blade support.

4,030,387

SHEET CUTTING MACHINE

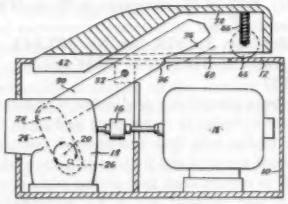
Norman Alan Finnimore, "Cornerstones" East Hill, Ottery Saint Mary, Devon, England

Filed May 5, 1975, Ser. No. 574,688

Claims priority, application United Kingdom, May 6, 1974, 19900/74

Int. Cl.² B26D *1/26*

U.S. Cl. 83—49 16 Claims



1. An asbestos sheet cutting machine, comprising a frame including a bed over which the sheet can be advanced to a cutting zone, a cutting blade mounted to the frame at the cutting zone, and drive motor for continually advancing the blade through the sheet, the bed having an elongate slot at the cutting zone through which the blade passes after cutting through the sheet whereby the sheet is supported by the bed on each side of the slot during the cutting action, a housing arranged to receive the blade on its return stroke and spaced from the bed so as to provide a gap for insertion of the sheet material to be cut while limiting the extent to which the cut sheet can lift from the bed, and a roller mounted to the housing through resilient means urging said roller towards the bed, said roller being rotatable to allow the sheet to be advanced towards the blade, the edge of the blade which contacts the sheet having a substantially flat transverse profile of about 3/16 inch width and the sides of the blade adjacent the cutting edge being hollow ground, so that the sheet is cut by the action of the blade in shearing from the sheet a strip of substantially the same width as the blade, the blade being pivotally mounted to the frame and linked to said drive motor so as to be moved thereby with an oscillating motion about its pivot at a rate of about 200 strokes/minute, the longitudinal profile of the cutting edge of the blade being curved so as to maintain an angle of about 17° with the sheet at the point of shearing as it moves through the sheet.

4,030,388

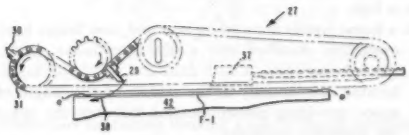
FILM SEVERING METHOD AND APPARATUS

Harold Eugene Ramsey, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 14, 1976, Ser. No. 686,507

Int. Cl.² B26D *1/26*

U.S. Cl. 83—49 7 Claims



1. A film severing method including the steps of:

engaging a portion of a film having first and second edges with a first holding means;

engaging another portion of the film by a second holding means; and

severing the film in a transverse path between the first and second holding means while the film is held on either side by such first and second holding means, such severing including

cutting the film at the first edge by moving a severing initiating means into the film at a position spaced from the first edge and thereafter in a first direction toward and through such first edge to form a partial cut, and completing the severing of the film by moving a severing completing means in a second direction into the partial cut and thereafter through the film toward and through the second edge thereof whereby to sever the film.

4,030,389

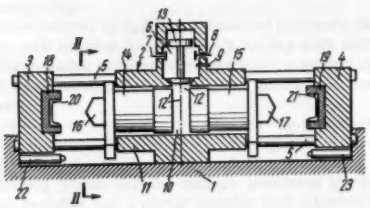
MACHINE FOR HIGH-SPEED PLASTIC WORKING OF MATERIALS

Nikolai Borisovich Ponomarenko, 531 mikroraion, 1a, kv. 49; Vadim Grigorievich Kononenko, ulitsa Chkalova, 15, kv. 12; Viktor Alexeevich Stelmakh, ulitsa Kirova, 18, kv. 2; Vladimir Ivanovich Kotelnikov, ulitsa Chuguevskaya, 29, kv. 39; Ivan Jurievich Valenya, ulitsa Materialisticheskaya, 27, kv. 11; Vladimir Nikolaevich Sarancha, ulitsa Kosmonavtov, 7a, kv. 71; Anatoly Avramovich Petrenko, ulitsa Borodivko, 39; Valery Pavlovich Bozhko, ulitsa Chkalova, 13, kv. 56; Sergei Vasilievich Yatsenko, Moskovsky prospekt, 204/1, kv. 36; Igor Pavlovich Komnatny, ulitsa Cheljuskintsev, 6; Levon Khachaturovich Akhnazariants, ulitsa Kospora, 23, kv. 23; Vitaly Evgenievich Strizhenko, ulitsa Osnovyanskaya, 56, kv. 2; Boris Alexeevich Kolokolov, ulitsa Kommunalnaya, 3a, kv. 9; Stanislav Anisimovich Maznichenko, ulitsa Geroev Truda, 28, kv. 188; Viktor Vasilievich Bozhko, ulitsa Chkalova, 15, kv. 206, all of, Kharkov; Oleg Alexandrovich Bondarenko, ulitsa Viktora Gjugo, 4, kv. 21, Gorlovka Donetskoi oblasti, and Robert Sharafutdinovich Zakirov, ulitsa Zapadnaya 8, kv. 2, Kharkov, all of U.S.S.R.

Continuation of Ser. No. 573,258, April 30, 1975, abandoned. This application May 26, 1976, Ser. No. 690,197

Int. Cl.² B26D *5/12*

U.S. Cl. 83—513 **2 Claims**



1. A machine for high-speed plastic working of materials utilizing the energy of explosion comprising:

a. a bed;

b. a frame rigidly secured on said bed, said frame having an explosion chamber and a power cylinder space, said space being open at both ends and a hole having an axis located substantially in the middle of the length of said space providing communication between the space and the explosion chamber;

c. two similar plungers mounted in the power cylinder space opposite to the axis of said hole and moving in synchronism in opposite directions under the force of high-pressure gases liberated by an explosion of a working medium in said explosion chamber and entering said power cylinder space through said hole;

d. two similar punches secured on said plungers opposite to each other;

e. two similar anvil blocks, each block being rigidly secured on said bed opposite to one of said punches symmetrically with the other of said anvil blocks relative to the axis of said hole and rigidly connected therewith;

f. two similar dies, each die being rigidly secured on one of said anvil blocks opposite to and coaxially with the respective punch;

g. and means for returning said plungers with said punches to the initial position.

4,030,390

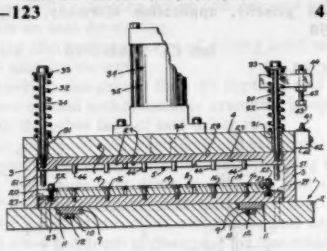
APPARATUS FOR CUTTING ITEMS FROM A SHEET

Richard H. Heiting, Little Chute, Wis., assignor to Fox Valley Tool & Die, Inc., Kaukauna, Wis.

Filed Sept. 10, 1975, Ser. No. 612,021

Int. Cl.² B26D *7/06, 5/20, 5/08*

U.S. Cl. 83—123 **4 Claims**



1. An apparatus for cutting a plurality of photographs from a sheet, comprising a housing defining an opening, a tray slidably mounted with respect to the housing from an extended position in which the tray is located outside of the housing to an inner position where the tray is located within the housing, a first die carried by the tray, a second die carried by the housing, one of said dies having a plurality of male die members corresponding in shape to the photographs to be cut from the sheet and the other of said dies having a plurality of female die members disposed to cooperate with said male die members to cut said photographs from the sheet located between said die members, a plate bordering said male die members, and means for biasing the plate outwardly away from the corresponding die to a position where the outer surface of said plate is generally flush with the outer surfaces of said male die members, operating means for moving one of said dies relative to the other of said dies to thereby cut said photographs from the sheet, and adjustable aligning means disposed on the tray for aligning the sheet with the die members associated with the tray, said aligning means comprising a plurality of rotatable cam means on said tray and disposed to be engaged by at least two edges of the sheet to align said sheet with respect to the corresponding die members, and locking means for locking the cam means in a given position

---

4,030,391

PUNCH PRESS WITH HYDRAULICALLY ACTUATED STRIPPER

James P. Swanson, Winnebago, and Stephen E. Nyquist, Cherry Valley, both of Ill., assignors to W. A. Whitney Corporation, Rockford, Ill.

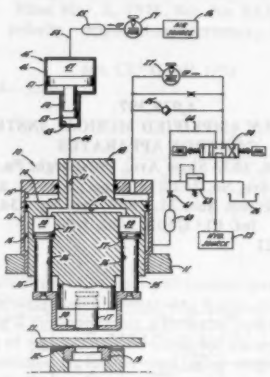
Filed Nov. 3, 1975, Ser. No. 627,843

Int. Cl.² B26D *7/02;* **B26F** *1/02*

U.S. Cl. 83—137 **5 Claims**

1. A punch press comprising a cylinder, a piston telescoped slidably into said cylinder to move back and forth therein and dividing the cylinder into first and second compartments, a punching element secured rigidly to said piston and movable back and forth in unison with said piston whenever the latter is moved within said cylinder, means for selectively admitting pressure fluid into said first compartment of said cylinder to advance said piston within said cylinder and cause said punching element to form a hole in a workpiece, a stripper associated with said punching element and adapted to engage and hold said workpiece as said punch first forms and then retracts from said hole, said stripper being supported to slide in first and second directions relative to said piston and having one end coacting with said piston to form a chamber, a supply of pressurized liquid within said chamber and biasing said stripper in said first direction relative to said piston, said stripper moving in said second direction relative to said piston and reducing the volume of said chamber during advance of said

piston after engagement of said stripper with said workpiece, said pressurized liquid expanding the volume of said chamber and retracting said piston after release of said pressure fluid from said first compartment of said cylinder, and means (a)



for maintaining said liquid under substantially constant pressure at all times during movement of said stripper in said second direction relative to said piston and (b) for enabling selective adjustment of the magnitude of said constant pressure.

4,030,392

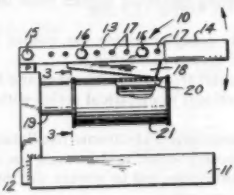
CAN SLITTING DEVICE

Lorenzo Torres, 15910 Hill St., LaPuente, Calif. 91744

Filed Jan. 29, 1976, Ser. No. 653,434

Int. Cl.² B23D *17/08*

U.S. Cl. 83—178 **4 Claims**



1. A can slitting apparatus comprising:

a vertical member supported on base means,

cylindrical support means extending from the vertical member and configurated to extend into and support a can,

a lever pivotally mounted on the vertical member, and

blade means on the lever to cut the can upon urging of the lever toward the cylindrical means,

said cylindrical support having at least one narrow axially extending peripheral slot adapted to receive said blade means as the can is cut thereby.

4,030,393

APPARATUS FOR CUTTING CONVEYED MATERIALS

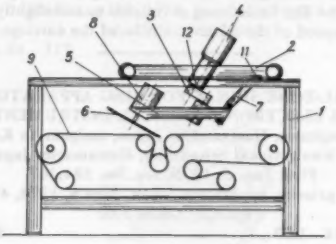
Anton Steiner, Baden, Austria, assignor to Semperit Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 524,956, Nov. 18, 1974, abandoned. This application June 16, 1976, Ser. No. 696,732

Int. Cl.² B23D *45/20*

U.S. Cl. 83—318 **4 Claims**

1. An apparatus for cutting conveyed materials, preferably webs or strand-shaped articles formed of reinforced or non-reinforced rubber by means of a cutter, comprising a cutter carriage movable in the transport direction of the conveyed materials, a drive motor secured to said cutter carriage, a crank driven by said motor, a balance constructed as a lever means, said cutter being mounted at said balance, said crank



being operatively connected to said balance, and a guide pivotably connected to said carriage and pivotably connected to said balance, said cutter describing a closed kinematic path of travel when said crank is driven by said motor.

4,030,394

DEVICE FOR CUTTING THROUGH A PILE OF SHEETS WITH A REVOLVING BLADE

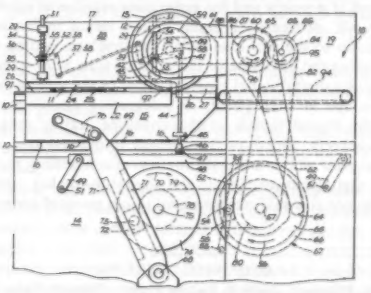
Hermann Kistner, Tømm, and Gunthart Lehmann, Heubach, Lautern, both of Germany, assignors to Maschinenbau Oppenweiler GmbH, Oppenweiler, Germany

Filed Aug. 16, 1976, Ser. No. 714,503

Claims priority, application Germany, Aug. 16, 1975, 2536558

Int. Cl.² B26D *7/06*

U.S. Cl. 83—409 **15 Claims**



1. Apparatus for cutting through a pile of sheets comprising a machine casing, a disk-knife rotatably mounted on said casing, the periphery of said disk-knife forming a circular cutting edge, conveying means for holding and supplying the pile of sheets to the disk-knife, said conveying means including a pair of confronting clamping members for clamping at least a portion of the pile of sheets therebetween, said clamping members being supported by a sliding carriage reciprocatingly movable relative to the machine casing and perpendicular to the rotational axis of the disk-knife in an advance stroke and a return stroke between a receiving end and a take-off end, a counter-knife supported by said one of said clamping members and forming a counter-cutting edge for the cutting edge of the disk-knife, said counter-cutting edge extending over the entire cutting range of the disk-knife and being arranged at a radial distance from the rotational axis of the disk-knife such that the cutting edges of the knives overlap only to an extent necessary to locate the cutting edges adjacent each other, the radius of the disk-knife being selected

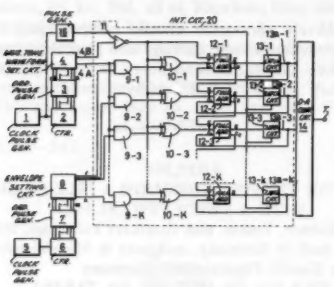
such that, for the thickest pile of sheets to be cut, a tangent line of the circular cutting edge of the disk-knife at the point of intersection of the disk-knife with the side of the pile sheets facing the disk-knife forms an angle with the plane of movement of the carriage of less than 30 degrees, the peripheral speed of the disk-knife being correlated to and slightly greater than the speed of the advance stroke of the carriage.

4,030,395

MUSICAL-TONE SIGNAL FORMING APPARATUS FOR AN ELECTRONIC MUSICAL INSTRUMENT

Toshio Kugisawa, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed June 5, 1975, Ser. No. 584,367
Claims priority, application Japan, June 6, 1974, 49-64382
Int. Cl.² G10H *5/02*
U.S. Cl. 84—1.03 **8 Claims**



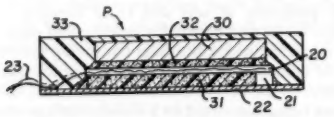
1. Musical-tone signal forming apparatus for an electronic musical instrument comprising a musical-tone waveform setting means for the sampling of the amplitude of a musical-tone waveform at *n* points and for generating relative to each point an increase, decrease or equal digital signal indicating the relationship to the previous point, an envelope setting means for sampling the envelope of the musical tone at *m* points and generating a digital signal representative of the analog value of the envelope at each point, an integrating circuit means in which the digital signals of the envelope setting means are accumulatively added or subtracted under control of the digital signals of the musical-tone waveform setting means to form a digital output signal, and digital-to-analog converter means to convert said output signal into a musical-tone signal.

4,030,396

ACOUSTIC PICKUPS

Ralph E. Mariner, 2060 S. Patton Court, Denver, Colo. 80219

Filed Oct. 17, 1975, Ser. No. 623,450
Int. Cl.² G10H *3/00*; **H01V** *7/00*
U.S. Cl. 84—1.16 **11 Claims**



1. A pickup for a stringed instrument, or the like, comprising, in combination therewith:

a. a body structure which is mounted upon said instrument;

b. a transducer means within the body structure arranged to respond to vibrations generated by said instrument and produce electrical signals corresponding to such vibrations; and

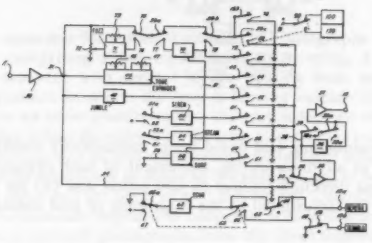
c. a mass, whose weight is substantially greater than the weight of the transducer means, mounted on the body, with the transducer means being effectively positioned between the mass and the instrument, whereby to cause the transducer means to react against the mass whenever it is responding to vibrations generated by the instrument.

4,030,397

ELECTRICALLY AMPLIFIED MUSICAL INSTRUMENT CONTROL APPARATUS

Walter E. Nelson, 1833 Shaw Ave., Pittsburgh, Pa. 15217

Continuation of Ser. No. 262,058, June 12, 1972, abandoned.
This application Nov. 21, 1975, Ser. No. 634,233
Int. Cl.² G10H *1/00*, *5/00*
U.S. Cl. 84—1.22 **9 Claims**



1. An electrically amplified musical instrument control apparatus for use with a musical instrument of a type having means for producing electrical signals representative of the sounds produced by the instrument, the apparatus comprising:

a pre-amplifier electrically connected to the instrument for boosting the incoming electrical signals from the instrument,

means for selectively complementing the output from the pre-amplifier, said means comprising:

a. a housing spaced apart from the instrument and having an electrical input terminal in electrical series with the pre-amplifier,

b. a plurality of transistorized electronic oscillating special effect circuits disposed within said housing for introducing background distortion and to govern the intensity of the overall frequency range,

c. a plurality of foot-operated switch means mounted on the outside of the housing, each one of the plurality of switch means being in electrical series with one of said special effect circuits to control the opertion thereof such that actuation of any one switch means actuates its associated effect circuit, each one of the plurality of switch means being in parallel circuit relationship with every other one of the plurality of switch means, whereby any one or more of said effect circuits is operable at any one time;

d. at least one summing amplifier disposed in said housing said amplifier being connectable in electrical series circuit relationship with each of said effect circuits,

e. means in said housing for providing a visible indication of the selection of said special effects circuits;

f. an output terminal; and

g. circuit means for interconnecting said electrical input terminal and said summing amplifier;

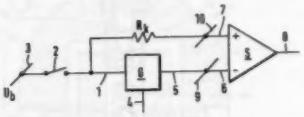
speaker means connected to the output terminal for converting the electrical output signals of the musical instrument and the means for selectively complementing into audible sound, and

wherein the output from the pre-amplifier is mixed with the output from the means for selectively complementing to produce said induced background distortion.

4,030,398
ELECTRONIC MUSICAL INSTRUMENT

Wilfried Dittmar, Halsenbach, Germany, assignor to WERSI-electronic GmbH & Co. Kommanditgesellschaft fur elektronische Gerate und elektronische Bauelemente, Halsenbach, Germany

Filed Mar. 4, 1976, Ser. No. 663,677
Claims priority, application Germany, Mar. 6, 1975, 2509684
Int. Cl.² G10H *1/02*
U.S. Cl. 84—1.26 19 Claims

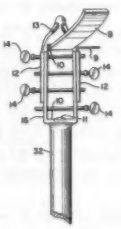


1. In an electronic key-operated musical instrument, such as an organ, a combination comprising a gate circuit including a gate having a first input for a constant voltage actuated by depression of a key, a second input for a sound signal and an output connected to further processing stages within the instrument, and a compensating circuit for suppression of bounce, said compensating circuit including at least one combining circuit having a first input connected with the output of said gate, a second input and an output connected to said further processing stages, and a source of compensating voltage connected with said second input of said combining circuit, said compensating voltage being dependent on the constant voltage actuated by depression of a key.

4,030,399
CLOSED PEG BOX ON STRINGED INSTRUMENT

Oresto P. Grottola, 930 S. Velare St., Anaheim, Calif. 92804

Filed Dec. 24, 1975, Ser. No. 630,522
Int. Cl.² G10D *3/14*
U.S. Cl. 84—304 4 Claims



1. A peg box for a stringed musical instrument having a neck, said peg box comprising:

peg box walls defining a peg box well and at least one rotatable shaft extending into said peg box well through one of said peg box walls for the attachment of a musical instrument string to said rotatable shaft for adjusting the tension and pitch of the string;

said peg box having an imperforate permanently positioned top wall to cover said shaft in said peg box well;

said neck having a finger board, said finger board terminating in a nut, a string mouth positioned between said top wall and said nut and extending into said peg box well to permit entry of strings into said peg box well;

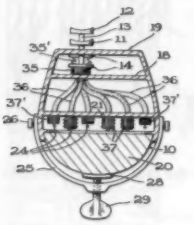
said peg box having an open back to permit access into said peg box well; and

a pivoted peg box door mounted on said peg box and positioned to selectively close the open back of said peg box well.

4,030,400
CHORD PLAYING ATTACHMENT FOR A STRINGED INSTRUMENT

Juan M. Del Castillo, Risco No. 119, Mexico City, Mexico (20 D.F.)

Filed Aug. 19, 1975, Ser. No. 605,874
Int. Cl.² G10D *3/00*
U.S. Cl. 84—317 6 Claims



1. Apparatus for use with a stringed instrument comprising a frame supported on the stringed instrument;

means to support said frame on the stringed instrument including means to adjust the compression of said frame against the stringed instrument;

said frame having upper, middle, and lower surfaces supported over a stringed portion of the stringed instrument;

a plurality of pushbutton means each adapted to receive the pressure applied to the stringed instrument by a single finger and designating a chord to be played, said pushbutton means positioned by said upper surface, and said middle surface in opposition to the force on said pushbutton means applied by the finger;

a plurality of hermetically sealed closed systems supported by said frame,

each of said hermetically sealed systems including

a first bellows connected to each of said pushbutton means having one end attached for movement with said pushbutton means,

a plurality of second bellows each smaller than said first bellows and formed to be in a contracted state when at rest position,

and conduit means for fluid pressure transmission connecting each of said second bellows to said first bellows;

said lower surface of said frame supporting said second bellows over the strings of the stringed instrument positioned so that each of said second bellows presses against a string when said second bellows is in an expanded state;

and spring means to hold said first bellows in an expanded state in its rest position and oppose a compressing force from said pushbutton means.

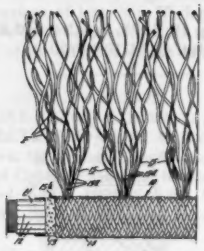
4,030,401
FAIRED ARTICLE

Henry Alexander Hood, Moorestown, N.J., assignor to Wall Industries, Inc., Beverly, N.J.

Division of Ser. No. 583,653, June 4, 1975, Pat. No. 3,975,980, which is a continuation-in-part of Ser. No. 499,278, Aug. 21, 1974, abandoned. This application June 7, 1976, Ser. No. 693,190
Int. Cl.² D04C *1/12*; D07B *1/14*
U.S. Cl. 87—6 14 Claims

1. A faired structure, comprising: an elongated core, a jacket around said core, and a series of fairings spaced apart along the length of the core, each of said fairings including a plurality of strands having base portions disposed along the core and gripped tightly by the jacket and having flexible

streamer portions splaying laterally outward from the core and terminating in free ends so that said streamer portions can flex



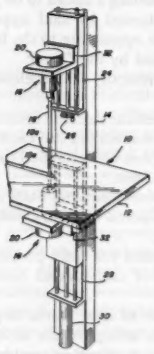
freely relative to the jacket in response to fluid flow across the structure.

4,030,402

TENSIONING DEVICE FOR A DOUBLE DRIVE PROFILE CUTTER

Charles R. Onsrud, 516 Berkshire Drive, Statesville, N.C. 28677

Filed Dec. 9, 1975, Ser. No. 639,165
Int. Cl.² B23C 5/26
U.S. Cl. 90—19 **6 Claims**



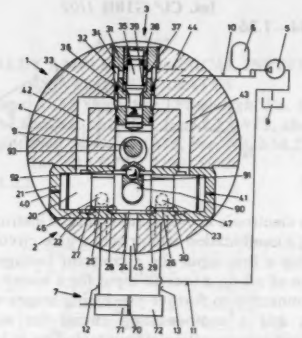
1. A machine for profile cutting a workpiece, comprising a slender axially elongated double-ended high speed cutting tool rotatable about its longitudinal axis and having a centrally located workpiece cutting portion and end portions, the length of said workpiece cutting portion being substantially greater than any lateral dimension thereof, said cutting portion having a substantially uniform lateral dimension throughout; axially aligned and rotatably mounted tool holding means in drive engagement with said tool end portions; drive means for each tool holding means, said drive means coacting with one another for overcoming dynamic loads imposed upon said tool cutting portion when the latter is rotating at high speed during oblique and cross cutting through the full thickness of the workpiece; a support for supporting the workpiece in a plane disposed intermediate the tool holding means and intersecting the tool rotary axis; a chassis supporting said tool holding means, said drive means and said workpiece support in a predetermined relationship; and guide means mounted on said chassis and engaging said drive means for controlling axial movement of one drive means and a corresponding tool holding means whereby the tool is subjected to a predetermined amount of axial tension overcoming rhythmic and cyclic torsional and bending loads imposed thereon during cutting of the workpiece.

4,030,403

POWER STEERING WITH ACCUMULATOR OPERATION

Dieter Elser, Bobingen, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Apr. 10, 1975, Ser. No. 566,829
Int. Cl.² F15B 11/08, 13/04
U.S. Cl. 91—448 **6 Claims**



1. A power steering system comprising:

a double acting servomotor and an accumulator;

a steering control piston valve (**20**) having a pair of piston heads;

a housing inlet and outlet ports and passages for connection to said servomotor and accumulator and having a bore in which said piston valve is shiftable;

a manually operable steering actuating means (**90**) engaging said piston valve for bidirectional movement to pressurize said servomotor selectively for corresponding bidirectional steering responsive to operator control;

said housing having pressure feed (**22, 23**) and exhaust grooves (**24**) coacting with respective piston heads to control flow through said passages and ports wherein a neutral position of said piston valve cuts off pressure feed to said double acting servomotor while effecting continuous connection for exhaust flow therefrom;

said passages having pressure feed passage means (**42, 43**) for flow from said accumulator to said pressure feed grooves;

valve means (**3**) in said passage means including bias means (**37**) biasing said valve means to normally cut off flow through said passage means;

actuating means for said valve means (**91, 92, 93**) engaging said piston valve and disposed to be operated only by manual force upon shift of said piston valve by said manually operable actuating means (**90**) to open said valve means when said piston valve is actuated to effect pressure feed to said servomotor;

said valve means comprising a conical valve head and a seat therefor and means biasing said conical valve head to seated position responsive to accumulator pressure;

a sleeve in which said valve head is slidable;

a portion of said valve means having reciprocal and sealed guidance in a portion of said sleeve;

said sleeve portion being closed except for a damping bore therein;

said pressure feed passage means comprising annular grooves on said sleeve upstream and downstream of said valve seat.

4,030,404

SWASH-PLATE DRIVE MECHANISM

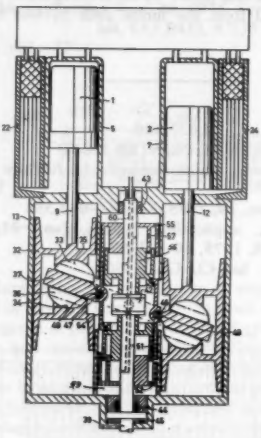
Roelf Jan Meijer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,463

Claims priority, application Netherlands, Aug. 6, 1974, 7410532

Int. Cl.² F01B *3/00, 13/04*

U.S. Cl. 92—12.2 4 Claims



4. In a machine having a wobble-plate drive mechanism, the machine including at least three reciprocating drive pistons and a drive rod extending axially from each of said pistons, the drive mechanism including a central drive shaft rotatable about its axis, a wobble-plate mounted on said shaft, said plate defining a plane transverse of the shaft axis and tiltable relative to said axis, said plate being fixed to rotate only with said shaft, said drive rods each having an end slidably engaging said plate, whereby the angle of tilt of the plate corresponds to the stroke of said drive pistons, and control means for tilting said plate, the improvement in combination therewith, wherein said control means comprises two pairs of first and second axially-spaced control pistons, the two control pistons of each pair being coaxially mounted on said shaft and being axially movable relative to said shaft axis and to each other, said control pistons of each pair having adjacent and axially spaced control surfaces defining and bounding a variable volume closed control space, said control means further comprising a source of fluid under pressure, duct means for flowing said fluid into said control spaces for driving said control pistons of each pair axially apart, and two coupling means, each coupling means pivotally connecting the control pistons of one of said pairs with said plate, said two coupling means spaced generally 180° apart around said shaft axis, whereby movement of said control pistons axially apart moves said two coupling means axially apart, thereby tilting said plate; each of said pairs of control pistons having a center of gravity located along the axis of said central shaft and respectively on opposite sides of said plate.

4,030,405

RADIAL PISTON MACHINE

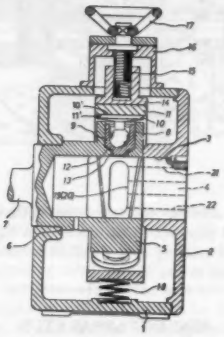
Ulrich Aldinger, and Günter Kersten, both of Stuttgart, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 21, 1973, Ser. No. 399,724

Claims priority, application Germany, Nov. 9, 1972, 2254752

Int. Cl.² F01B *13/06*

U.S. Cl. 92—58 12 Claims



1. A radial piston machine, comprising a stationary member; a cylinder body mounted on said stationary member for rotation with respect thereto and having a plurality of cylinder bores bounded by internal surfaces, said stationary member and said cylinder body having neighboring contact regions of case-hardened steel and alloyed pearlitic iron, respectively, in sliding contact with one another; pistons mounted in said cylinder bores for reciprocation therein and having external surfaces in sliding contact with said internal surfaces, said pistons and said cylinder body having portions of case-hardened steel and alloyed pearlitic iron, respectively, defining said external and internal surfaces; a piston-control ring of steel adjacent said cylinder body; and glide shoes on said pistons and in sliding contact with said piston-control ring.

4,030,406

APPARATUS FOR STERILIZATION

Raoul Wander, 11 bis rue Jean Goujon, 75 Paris 8eme, and Robert Angue, 9 La Bastide, Chemin du Puy St., 06600 Antibes, both of France

Continuation-in-part of Ser. No. 93,015, Nov. 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 718,044, April 2, 1968, abandoned. This application Oct. 3, 1972, Ser. No. 294,578

Claims priority, application France, Apr. 18, 1967, 67.103192; Dec. 15, 1967, 67.132589

Int. Cl.² A23C *3/00;* A23L *3/00*

U.S. Cl. 99—461 10 Claims

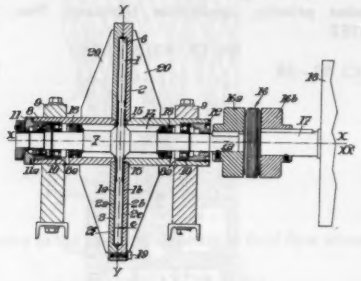
1. An apparatus for sterilizing a product which may contain microorganisms, comprising:

a first member and a second member, said two members having respective cooperating opposed substantially planar surfaces, said first member comprising a rotatable disc having an annular ring in gripping engagement with the disc around its periphery, said second member comprising a fixed housing within which said first member is disposed, said first member having two principal surfaces each of which is spaced from a corresponding substantially planar opposed surface of said housing;

inlet means for the charging of said product into said space between said two opposed surfaces of said two members, said inlet means in said housing being in the area of the center of said first member;

outlet means for said product flowing in the space between the surfaces of said first and second means; and

driving means for driving at least one of said members about its axis to produce a linear peripheral speed of at least 50 meters per second and applying sufficient centrifugal force to said product to maintain it in liquid form under pressure and causing said product in said space to flow from the inlet to the outlet.



4,030,407
BINDING APPARATUS

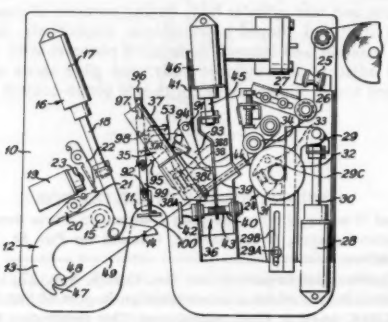
Thomas William Jesty, Dorchester; John Anderson, Surrey, both of England, and 53, 198 A, assignors to T.W. Jesty & Partners, Dorchester, England

Filed Sept. 18, 1975, Ser. No. 614,438

Claims priority, application United Kingdom, Sept. 20, 1975, 41108/74

Int. Cl.² B65B *13/28*

U.S. Cl. 100—4 **25 Claims**



1. Apparatus for forming a loop of strip material around a bunch of elongate articles which is to be tied so that the ends of a length of strip material so looped can be twisted together to complete a tie around the bunch; the apparatus comprising

a. means for locating a length of strip material adjacent a station at which a bunch of elongate articles to be tied is positioned during use of the apparatus, the strip material locating means being adapted to locate such a length of strip material so that it extends laterally with respect to a bunch of elongate articles positioned at said station, said means for locating including

means for drawing the length of strip material from a stock of such material and for feeding the length of strip material longitudinally adjacent to and past the station, and

guiding means for guiding the length of strip material along a linear path which extends from the point where the strip material exits from the drawing and feeding means adjacent to and past said station;

b. movable means movable to and fro along an orbital path around said station from one rest position and having a part which is adapted to engage part of a length of strip material located adjacent said station by said strip material locating means so as to move one end of that length of strip material around a perimeter of said station,

c. means which coact with another part of the length of strip material so as to restrain the other end of the length of strip material from following said one end as said one end is moved around the station by the movable means so that the length of strip material is looped around the station and thus around a bunch of elongate articles located at the station; and

d. control gear for controlling sequential operation of parts of the apparatus so that said part of the movable means is located to one side of the linear path when it is at said one rest position and the length of strip material is fed adjacent to and past said station by the feeding means without being deflected from the linear path by said movable means.

4,030,408
THERMAL PRINTER HEAD

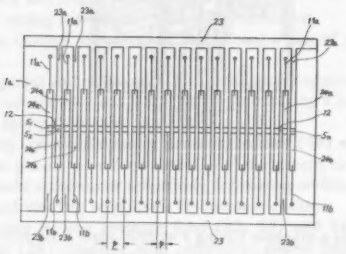
Takeshi Miwa, Kyota, Japan, assignor to Juichiro Ozawa, Kyoto, Japan

Filed Dec. 19, 1975, Ser. No. 642,354

Claims priority, application Japan, Jan. 21, 1975, 50-009449; Nov. 10, 1975, 50-153397

Int. Cl.² G02B *7/06*

U.S. Cl. 101—1 **3 Claims**



1. A thermal printer head for printing on heat sensitive paper under the condition in which there is relative motion between the printer head and the paper, said printer head comprising a cylindrical insulator base having a plurality of shallow linear recesses in the cylindrical surface thereof along a single line parallel to the cylinder axis, heat generator film resistors within said recesses and filling said recesses to a level just below the surface of the base surrounding the recesses, the areas of the surface of the base between said recesses contacting the heat sensitive paper during a printing operation and frictional contact occurring only between the base and the paper, and the heat generator film resistors being protected from abrasion due to friction between the resistors and the paper, said heat generator film resistors having first film conductor terminals extending therefrom around said cylindrical insulator base, the first film conductor terminals from alternate heater elements extending in opposite directions around the cylindrical insulator base, and said heat generator film resistors having second lead wire terminals extending therefrom around the cylindrical insulator base in the opposite directions from the first film conductor terminals in the spaces on the surface of the cylindrical insulator base between the first film conductor terminals and for a distance less than the length of said first terminals, whereby the arrangement of the heat generator film resistors is compact due to the fact that the pitch therebetween is half the itch between adjacent first film conductor terminals and adjacent second lead wire terminals

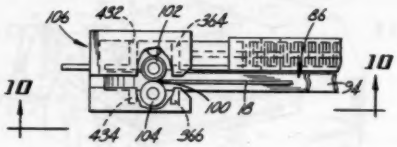
and the printer head is suitable for a line-dot type printer head.

4,030,409

PRINTING APPARATUS CONTROLS

Manoj C. Adhikari, Wickliffe, and Joseph G. Gardner, Painesville, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Continuation of Ser. No. 326,920, Jan. 26, 1973, abandoned.
This application Apr. 28, 1975, Ser. No. 572,126
Int. Cl.² B41L 47/56
U.S. Cl. 101—47 9 Claims



1. In apparatus for printing on a sequence of sheets of material in turn at a printing station, each with a different one of a sequence of printing plates, which apparatus is cyclically operable and includes means for feeding sheets one by one into and away from the printing station, means for feeding plates one by one into and away from the printing station, both during a first portion of the cycle, and means for transferring an impression from a plate to a corresponding sheet during a second portion of the cycle, the improvement which comprises:

means for sensing for the presence of the sheets and plates at certain locations and for generating signals representative of the presence or absence of sheets and plates thereat, and circuit means controlling operation of the machine in accordance with said signals, said circuit means including:

means for signalling the transition from the first cycle portion to the second cycle portion;

means for analyzing the signals generated by the sensing means to determine whether, at the time of said transition, there exists a condition such that the printed sheet has been moved away from the printing station and a succeeding sheet is present in the printing station;

means for analyzing the signals generated by the sensing means to determine whether at the time of said transition there exists a condition such that the printing plate used to mark the printed sheet has been moved away from the printing position and a succeeding print plate is present therein;

means for generating a signal for continuation of operation of the apparatus providing the analyzing means signal that both of said conditions are affirmative;

manually operable control means for initiating feeding of a sheet to the printing station;

manually operable control means for initiating feeding of a plate to the printing station;

first control means for rendering said manually operable sheet control means effective only if the condition preventing continuation of operation is lack of a sheet at the printing station; and

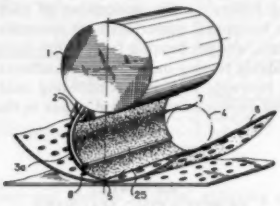
second control means for rendering said manually operable plate control means effective only if the condition preventing operation is lack of a plate at the printing station.

4,030,410

DYESTUFF APPLICATOR FOR SCREEN PRINTER

Peter Zimmer, Untere Sparchen 54, A 6330 Kufstein, Austria

Continuation of Ser. No. 440,043, Feb. 6, 1974, abandoned.
This application Sept. 30, 1975, Ser. No. 618,204
Claims priority, application Austria, Feb. 14, 1973, 1330/73
Int. Cl.² B41F 15/44
U.S. Cl. 101—120 3 Claims



1. In a printing machine, in combination:

a movable printing screen provided with apertures for the passage of dyestuff to an underlying substrate;

a dyestuff-supplying tube spacedly overlying a limited area of contact between said screen and said substrate;

applicator means mounted on said tube for facilitating the penetration of said dyestuff through said screen in said area of contact, said applicator means comprising a metallic doctor blade extending substantially radially downward from said tube and curving in the direction of screen movement, said blade approaching said area of contact substantially tangentially to said screen and terminating in a free edge bearing resiliently upon said screen;

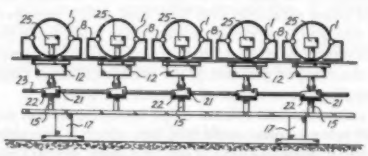
elastic strip means hugging said blade on the concave side thereof for reinforcing same, said strip means having a thickness greater than that of said blade and extending over the major part of the blade surface with a curvature conforming to that of said blade and terminating short of said free edge thereof and of the inner screen surface, said tube being provided with a pair of radially extending lips clamping sections of said blade and of said strip means between them, said lips being angularly offset from the vertical in a direction opposite the direction of screen movement.

4,030,411

ROTARY-SCREEN PRINTING MACHINE

Peter Zimmer, Untere Sparchen 54, A6330 Kufstein, Austria

Filed June 20, 1975, Ser. No. 588,592
Claims priority, application Austria, July 3, 1974, 5500/74
Int. Cl.² B41F 15/24
U.S. Cl. 101—126 4 Claims



1. A rotary-screen printing machine comprising:

a plurality of cylindrical printing screens rotatable about parallel axes lying on a common level;

a machine frame provided with journal bearings for said printing screens;

drive means for rotating said printing screens, said drive means including pinions on said machine frame and gears in mesh with said pinions, said gears being rigid with said printing screens and being coaxially secured to the ends thereof;

a dyestuff applicator within each printing screen;

a plurality of beds each underlying one of said printing screens and forming a flat horizontal surface for supporting a substrate to be imprinted with dyestuff from said applicator; and

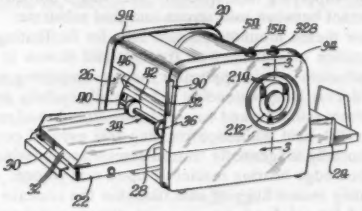
elevation-adjusting means inserted between said frame and said beds for simultaneously varying the distance of all said beds from said level to compensate for changes in the thickness of the substrate, said elevation-adjusting means including rollers on the undersides of said beds, bases with flat horizontal upper surfaces spacedly confronting said rollers, wedges bearing from below upon said rollers while slidably resting on said upper surfaces, and a horizontally movable link interconnecting said wedges for horizontal displacement on said upper surfaces.

4,030,412

DUPLICATING MACHINE

Edward M. Springer, Chicago, Ill., assignor to Heyer Inc., Chicago, Ill.

Filed Apr. 7, 1976, Ser. No. 674,367
Int. Cl.² B41L *11/08*
U.S. Cl. 101—132 **16 Claims**



1. In a duplicating machine having a frame, a rotatable printing drum with means for supporting a master sheet thereon, an impression roll positioned to press copy sheets against the master sheet on the drum, a support for a stack of copy sheets adjacent an inlet end of said housing, feeding means for advancing copy sheets successively from the stack into the housing between the drum and impression roll for printing from the master sheet onto the copy sheet, drive means for rotating the drum, means for automatically stopping the drum with the end of the master sheet at a predetermined position beyond the impression roll comprising in combination:

clutch means including driving and driven clutch members connected respectively to said drive means and to said drum, means for engaging said clutch members to enable said drive means to rotate said drum, a release collar connected to said driven member for rotation therewith and being rotatable with both said clutch members when so engaged, and means to disengage said clutch members and enable said drum to stop at a position corresponding to the stopped position of the release collar in response to stopping the rotation of said release collar;

stop means for said release collar including detent means on said release collar and a stop arm which is movable to and from a stop position engaging said detent means to thereby stop said release collar;

a manually movable starter arm movable to and from a start position;

means including a mechanical connection between said starter arm and said stop arm being responsive to manual movement of said starter arm to its said stop position to move said stop arm away from its said stop position and to simultaneously actuate said drive means to rotate said drum through said clutch means;

means including copy sheet sensing means having a follower sensitive to said stack of copy sheets to maintain said starter arm in its said start position while a copy sheet in said stack remains on said support; and

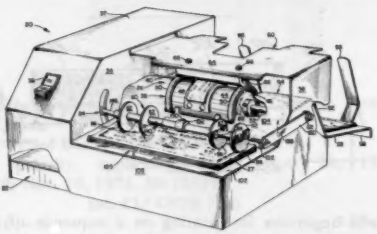
said means including said copy sheet sensing means being further responsive to the last copy sheet leaving the support to automatically move said stop arm into engagement with said detent means to stop said release collar and to disengage said clutch members while simultaneously deactuating said drive means to stop said drum at a predetermined position corresponding to the stopped position of said release collar.

4,030,413

MECHANISMS FOR FEEDING DOCUMENTS FROM A STACK THEREOF

Robert D. Young, Rte. 1, Box 81, Accord, N.Y. 12404

Filed Apr. 30, 1975, Ser. No. 573,175
Int. Cl.² B65H *1/04*; B41F *5/02*
U.S. Cl. 101—232 **5 Claims**



1. A document feed mechanism which includes a document support means; a feed mechanism for displacing a document along a rectilinear path from said support means; and means which engages the displaced document and propels it along a continuation of said rectilinear path, said feed mechanism including a shaft extending at right angles to the path of movement of the document; means for rotating said shaft at a preselected speed; a document engageable, rotatable feed member journalled on said shaft; means for drive connecting said feed member to said shaft so that said shaft can rotate said feed member to initiate the displacement of the document, so that the feed member can thereafter rotate relative to the shaft as engagement of a document by the means which propels it along the continuation of the rectilinear path results in a change in the speed at which the document is then moving, and so that the shaft can rotate relative to the feed member at the end of the feed cycle, the means for drive connecting the feed member to the shaft on which it is journalled comprising a single means interconnecting said shaft and said feed member and providing limited rotation of said feed member with respect to said shaft and a pivotal interconnection between said feed member and said shaft whereby said feed member can pivot about said single means within a plane drawn through the axis of said shaft to thus promote uniform contact between said feed member and the document being displaced; a driven gear rotatable with said feed member; a driving gear meshed with said driven gear; means for rotating said driving gear in a direction opposite to the direction of document displacement; and means supporting said feed member and said driven gear for movement in an arcuate path about the axis of rotation of the driving gear whereby document engendered resistance to rotation of the feed member will create a reaction torque tending to move said feed member upwardly in said arcuate path, thereby lessening the pressure on any documents remaining on said support means as the document engaged by the feed member is displaced and reducing the tendency of a second document to be displaced with the document engaged by the feed member.

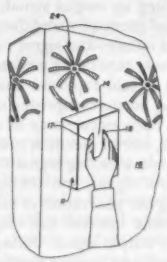
5. A document feed mechanism which includes: a document support means and rotatable feed means for engaging and

displacing a document from said support means, said feed means comprising an elongated shaft, disc-shaped supports at intervals along said shaft, and replaceable, document engageable drive members each being made of a material having a high coefficient of friction and having a configuration in the shape of a segment of a circle extending about one-half way around said support, each drive member and its support further including means for detachably fixing the drive member on its support whereby each drive member may be easily removed when worn and replaced by a new drive member, and said means for detachably fixing each drive member on its support comprising a pair of headed projections extending laterally from said support and a pair of mounting legs on said drive member, each leg including means defining a mounting hole therein whereby said legs may be easily slipped onto said support over said projections and removed therefrom.

4,030,414
WALL DECORATING PAINT APPLYING DEVICE

James T. McGuire, 3822 S. Rio Blanco, Las Vegas, Nev. 89101

Filed May 16, 1975, Ser. No. 578,086
Int. Cl.² B41K *1/02*
U.S. Cl. 101—379 **2 Claims**



1. A wall-decorating paint-applying device comprising:

a one-piece block-shaped unitary, soft compressible, resiliently self-restoring, sponge body having a deformable cellular paint retaining and applying face formed with relieved portions defining a decorative design to be applied to a wall or the like and a rear side; and

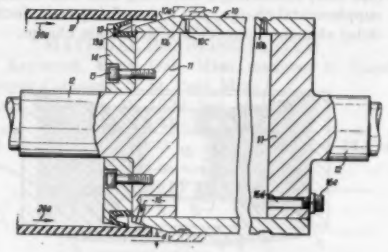
means to enable flexing of said body and face to enable selected substantially undistorted parts of said design to be applied to said wall surface, said means including elongated finger-receiving recesses formed in said rear side, each recess capable of receiving a plurality of fingers, said rear side being opposite and substantially parallel to said face, said recesses leaving therebetween an elongated, integral, finger-grippable soft compressible sponge handle portion substantially flush with said rear side for manual squeezing and handling of said device and pressing of said face onto a wall surface to be decorated, the flexibility and compressibility of said handle portion providing flexing of said body and face.

4,030,415
FLEXOGRAPHIC PRINTING ROLL HAVING FLUID PRESSURE GROOVING FOR DISMOUNTING

Stanley Fellows, Warrington, England, assignor to M.A. Buckley (Engraving) Limited, Warrington, England

Filed Sept. 22, 1975, Ser. No. 615,509
Claims priority, application United Kingdom, Sept. 26, 1974, 41814/74
Int. Cl.² B41F *27/00*
U.S. Cl. 101—382 R **4 Claims**

1. A flexographic printing roll comprising a rigid base tube having perforations in the form of a plurality of small apertures and shallow external grooving extending circumferentially away from said apertures so that fluid pressure appearing at the apertures is distributed circumferentially by said grooving, and a circumferentially stretchable, elastomeric, engraved, seamless printing sleeve on said tube strained to grip the tube to retain the sleeve securely on the tube, said printing



sleeve covering said shallow external grooving such that increasing fluid pressure in said grooving relative to fluid pressure on the exterior of said sleeve would cause said printing sleeve to expand and be readily removable from said tube.

4,030,416
WATERLESS PRINTING MASTERS

Richard L. Schank, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 517,347, Oct. 23, 1974. This application July 30, 1976, Ser. No. 710,357
Int. Cl.² B41M *1/00;* **G03F** *7/02*
U.S. Cl. 101—450 **2 Claims**

2. A method of printing comprising selectively inking a printing master having image areas of ink receptivity and nonimage areas of ink releasability formed of a substrate, an overlying layer of a copolymer of 50–99 percent by weight of siloxane blocks cured to an ink releasable condition and organic ink receptive thermoplastic blocks, and contracting the resultant inked master with an image receiving surface to transfer said image.

4,030,417
UNIVERSAL FOUNTAIN SOLUTION FOR LITHOGRAPHIC OFFSET PRINTING

Stanislava N. Lipovac, Silver Spring, Md., assignor to Westvaco Corporation, Laurel, Md.

Filed Aug. 11, 1975, Ser. No. 603,291
Int. Cl.² B41M *1/00;* **C09D** *5/20*
U.S. Cl. 101—451 **36 Claims**

1. A method of treating an offset printing plate for printing comprising applying to an offset printing plate a fountain solution comprising water, a desensitizing gum, a monovalent hydroxide selected from the group consisting of potassium, sodium, lithium and ammonium hydroxides, a monovalent iodide selected from the group consisting of sodium, potassium and lithium iodides, and a fatty acid material having at least about 6 carbon atoms in the linear chain.

4,030,418
GRAVITY DEPLOYED MINE WITH COMBINED UPPER CLEARING CHARGE FIRING AND DELAYED MAIN CHARGE INITIATION

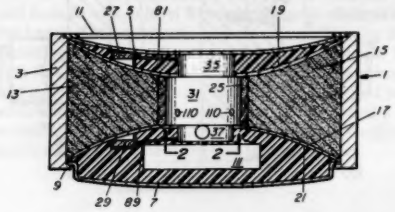
Norman Regber, Rockaway; Ferdinando V. Dukic, and Frank Diorio, both of Lake Hopatcong, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 30, 1975, Ser. No. 627,176
Int. Cl.² F42B *21/00, 23/26, 1/02, 3/10*
U.S. Cl. 102—8 **9 Claims**

1. In a high-explosive land mine comprising a housing containing a high-explosive main charge, a separate supplemental

explosive charge, and fuze means for first initiating said supplemental charge and then, after a predetermined delay time, initiating said main charge; said fuze means comprising:

a fuze body containing a fast firing train connected to said supplemental charge, and a slow firing train, including a delay element, connected to said main charge;



an arming member, slidable in said fuze body between a safe position and an armed position, at least a portion of each firing train carried by said arming member, both firing trains being completed by said arming member in its armed position only; and

means for initiating said firing trains substantially simultaneously, in response to a single firing signal.

4,030,419

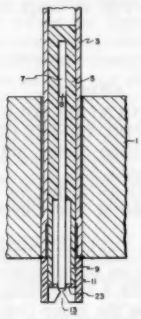
INSERT FOR EXPLOSIVELY EXPANDING A TUBE INTO ENGAGEMENT WITH A TUBE SHEET

Emil P. Loch, Tampa, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 634,000

Int. Cl.² C06C *11/00;* **F42B** *1/02, 3/00*

U.S. Cl. 102—24 R **5 Claims**



1. A resilient insert for explosively expanding tube into a tube sheet utilizing an explosive cord, said resilient insert comprising an outer diameter which is slightly smaller than the inner diameter of said tube, a length substantially longer than said tube sheet is thick, a bore extending from one end of said insert for receiving said explosive cord, said bore being substantially longer than the tube sheet is thick, but not extending all the way through said insert, a counterbore, a sleeve attached to the outside of the end of said insert having the bore and counterbore, one end of said sleeve extending beyond the end of said insert and having diametrically opposed slots, the bottom of said slots being disposed adjacent the end of said insert, the other end of said sleeve being abuttable against the end of said tube, a positioning wafer having an outer diameter slightly smaller than the inner diameter of said sleeve, said wafer having a centrally disposed opening which tightly embraces said explosive cord and abuts the end of the insert to position the explosive cord within the bore of the insert.

4,030,420

DEVICE FOR GROUND-CONTROLLED ACTIVATION OF PROXIMITY FUZES

Lars-Erik Skagerlund, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Oct. 15, 1975, Ser. No. 622,784

Claims priority, application Sweden, Nov. 1, 1974, 7413757

Int. Cl.² F42C *13/04, 13/00*

U.S. Cl. 102—70.2 P **10 Claims**

1. The combination of structure comprising a missile carrying an explosive charge, a proximity fuse in said missile, said proximity fuse comprising transmitter means in said missile for radiating energy, the radiated energy being operative upon reflection to produce echo signals, receiver means in said missile responsive to the reception of said echo signals from the ground surface as well as from obstacles on the ground and from a target for producing an output signal, means for producing a blocking signal of predetermined duration commencing with the firing of said missile, and signal processing means in said missile for selectively generating a control signal operative to initiate explosion of said explosive charge in said missile, said signal processing means comprising means for generating said control signal upon occurrence of an output signal from said receiver means, circuit means in said missile responsive to the presence of said blocking signal for inhibiting the generation of said control signal, and timing means in said missile for also inhibiting the generation of said control signal until a predetermined time interval has elapsed, preceding occurrence of a receiver output signal, during which interval no output signal was produced by said receiver means.

4,030,421

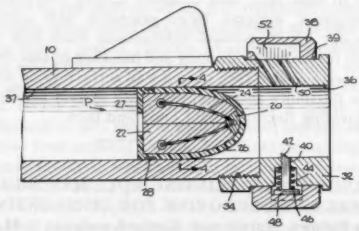
DUAL PURPOSE PROJECTILE AND WEAPON COMBINATION

Alan Litman, Pittsburgh, Pa., assignor to Smith & Wesson Chemical Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 590,540, June 26, 1975, abandoned, which is a division of Ser. No. 485,560, July 3, 1974, abandoned. This application July 2, 1976, Ser. No. 702,173

Int. Cl.² F42B *11/36*

U.S. Cl. 102—92.3 **4 Claims**



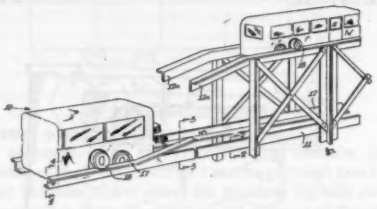
1. A dual purpose projectile for firing from a weapon comprising a body including a forward nose portion and a pluraity of body segments, means located adjacent the nose of said projectile securing said segments one to the other for movement between first and second configurations, said segments in said first configuration being disposed in close juxtaposition one to the other and forming a substantially bullet-shaped projectile body having a predetermined diameter, said bullet-shaped projectile body having a longitudinal axis, said segments in said first configuration thereof being circumferen-

tially spaced one from the other about said axis, said segments in said second configuration being spaced one from the other and forming a projectile body having a diameter larger than said predetermined diameter affording increased frontal area in a direction normal to the trajectory of the projectile when fired from the weapon, and means for releasably retaining said segments in said first configuration, said retaining means including a band encompassing said segments in the first configuration thereof adjacent the end of said projectile remote from its nose.

4,030,422
SWITCHING SYSTEM FOR GUIDED VEHICLES

Raymond F. Pasquan, 232 First Ave., Toronto, Ontario, Canada

Filed Dec. 8, 1975, Ser. No. 638,326
Int. Cl.² E01B *25/06*
U.S. Cl. 104—131 **6 Claims**



1. A switching system for guided vehicles, comprising

a main guideway having a pair of horizontally spaced main guides, each main guide having a vertically disposed running surface and a horizontally disposed running surface, the vertically disposed surfaces on said main guides facing one another and extending upwardly from and outwardly of respective ones of said horizontally disposed running surfaces,

a secondary guideway having a pair of horizontally spaced secondary guides, each secondary guide having a vertically disposed running surface and a horizontally disposed running surface, the vertically disposed surfaces of said secondary guides facing one another and being spaced apart the same distance as said vertically disposed surfaces of said main guides, the horizontally disposed running surfaces of said secondary guides being located outwardly of said vertically disposed running surfaces of said secondary guides,

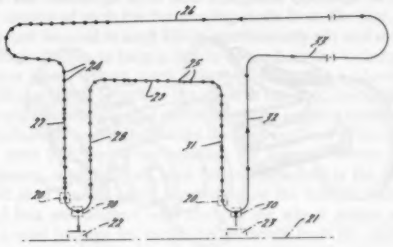
said secondary guides joining said main guides at a switching region, each of said vertically disposed surfaces of said secondary guides and said main guides being one in the same vertically disposed surface prior to the switching region and being co-extensive with each other in said switching region, said secondary guideway diverging vertically from said main guideway with said horizontally disposed surfaces of said secondary guides being at a level which is above said horizontally disposed surfaces of said main guides,

a vehicle having main support means for coacting with said horizontally disposed surfaces of said main guides for supporting said vehicle on said main guides, guide means for coacting with said vertically disposed surfaces on each side of said vehicle for providing lateral guidance, and retractable support means on both sides of said vehicle having a retracted and an extended position, said retractable support means in its retracted position being clear of all guides and adapted to be moved to its extended position prior to said vehicle reaching said switching region with said retractable support means being above and clear of said horizontally disposed surfaces of said secondary guides whereby when said vehicle reaches said switching region said retractable support means coacts with the horizontally disposed surfaces of said secondary guides to support said vehicle thereon, the coaction between said guide means and said vertically disposed surfaces being continuous.

4,030,423
MATERIAL HANDLING SYSTEM

Robert Krammer, Royal Oak, Mich., assignor to Standard Conveyor Company, N. St. Paul, Minn.

Filed Nov. 29, 1974, Ser. No. 528,322
Int. Cl.² B61B *13/00*
U.S. Cl. 104—172 S **28 Claims**



1. In a material handling system having downwardly and upwardly extending conveyor legs, a powered endless member movable along a path carrying driving dogs, a series of workpieces carrying trolleys supported for free movement alongside said endless member, first means on each trolley movable between a retarding position coacting with a driving dog during travel on a downward leg to cause movement of the trolley with the driving dog, and a free position clear of the path of said driving dogs, second means on each trolley movable between a free position clear of the path of said driving dogs and a driven position in said path, means urging said second means toward its free position causing said driving dogs to pass both said first and second means of a blocked trolley, and actuating means for moving said second means to its driven position, said actuating means being selectively operable and located alongside an upward leg of the conveyor, means extending from the bottom of said upward leg to a predetermined height for preventing movement of said first means from its retarding position, causing a driving dog to engage said first means to lift a trolley to said predetermined height, and holding means at said predetermined height for preventing said trolley from dropping.

4,030,424
RIGID RAILWAY CAR TRUCK

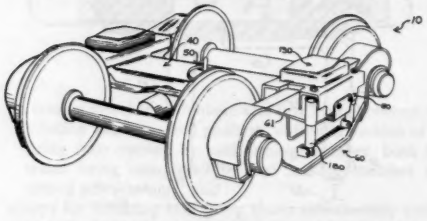
Gerald D. Garner, Florissant; James C. Hammonds; Jan D. Holt, both of St. Charles, and Conway H. Melcher, Kirkwood, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 29, 1975, Ser. No. 572,930
Int. Cl.² B61F *3/08, 5/06, 5/08, 5/14*
U.S. Cl. 105—182 R **21 Claims**

1. A railway truck comprising:

a pair of longitudinally spaced, transversely extending wheel axles having wheels and journal bearings mounted on opposite ends of said axles; a pair of transversely spaced side frames extending longitudinally of said truck each supported by said journal bearings outboard of said wheels; said side frames each having side frame openings at about the midpoint thereof; a vertically compressible spring assembly mounted within each of said side frame openings; a bolster extending transversely between said side frames, with opposite end portions of said bolster in vertical allignment with said side frame openings and supported on said spring assemblies for vertical movement relative to said side frames; a transom extending,

transversely between said side frames located below said bolster and rigidly affixed at its opposite ends thereof to each of said side frames; said transom connected solely to said side frames maintaining said side frames in parallel relationship and resisting truck hunting; said transom having sufficient torsional flexibility to allow said side frames to rock relative to each other about an axis transverse to said truck; a bolster center bearing located centrally of said bolster adapted to provide a connection of said bolster to a railway car body; a pair of car body bearing assemblies mounted on said bolster, one on each



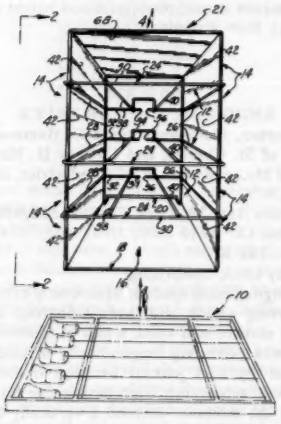
side of said bolster center bearing; said car body bearing assemblies each having an upper surface of low friction material, whereby said truck rotates with respect to said car body by virtue of said low friction material, and whereby the weight of the car body is supported by said car body bearing assemblies and is transferred through said bolster to said spring assemblies, and from said spring assemblies to said side frames and through said bearings and wheel axles to said wheels, and whereby horizontal forces applied to said car body are transmitted through said bolster center bearing through said bolster to said side frames.

4,030,425

ARTICLE SUPPORT ASSEMBLY

David L. Yeomans, 3985 Fairmount Blvd., Cleveland Heights, Ohio 44118

Filed Mar. 4, 1976, Ser. No. 663,997
Int. Cl.² A47B *3/00*
U.S. Cl. 108—111 **11 Claims**



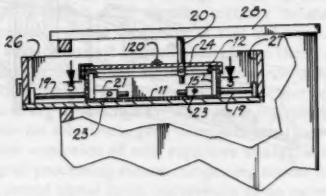
1. A support assembly comprising a plurality of flat open rectangular gridworks disposed in a spaced apart parallel relationship, each of said gridworks being formed by a plurality of interconnected rod elements, a plurality of elongated side panels each of which is associated with corresponding outer edge portions of two of said flat gridworks and extends perpendicular to said gridworks, each of panels having a longitudinal extent which is substantially as great as the extent of the associated outer edge portions of the flat rectangular gridworks, a plurality of connector means connected with and disposed adjacent to a corner portion of each of said flat rectangular gridworks, a plurality of connector means connected with and disposed adjacent to a corner portion of each of said flat rectangular gridworks for connecting said panels with the associated gridworks and for holding said side panels and associated gridworks against relative movement.

4,030,426

TRAV-L-SAFE

Joseph Lyons, 35 Bonnie Lane, Berkeley, Calif. 94708

Filed May 23, 1975, Ser. No. 580,309
Int. Cl.² E05G *1/02*
U.S. Cl. 109—51 **3 Claims**



1. A portable rectangular strong box adapted to be secured temporarily in the drawer of a desk or bureau against unlawful removal said portable strong box comprising: a bottom, integral substantially perpendicular sides and ends, each end having a horizontal aperture therein, and a two-part cover, one part of which has a vertical aperture therein, the said one part of said cover being fixed to the adjacent upper edges of said sides and to the adjacent upper edges of the corresponding end of said box, a hinge secured to the fixed one part of said cover, said hinge constructed and arranged to connect the second part of said cover to the fixed one part thereof, locking-means mounted on said second cover part constructed and arranged to releasably lock the hinged second cover part to the corresponding end of said box, box securing means within said box comprising three metal rods each rod having an inner end and an outer end, a pair of rod supporting means housed within said box each comprising a cylindrical sleeve fixed to the bottom of said box and at opposite ends thereof, respectfully, the longitudinal axis of each of said pair of sleeves being parallel to the plane of the bottom of said box, substantially at right angles to the plane of the corresponding apertured end thereof and in axial alignment with the horizontal aperture therein, the inner end of each rod of a pair of said metal rods being slidingly mounted in one of the cylindrical rod supporting sleeves and the length of each rod of said pair of rods being such that its outer end extends through the aperture in the corresponding end of said box to contact a corresponding wall of said drawer, rod fastening means within said box comprising a set screw in each of said rod supporting sleeves constructed and arranged to hold each rod of said pair of rods temporarily in its extended position in contact with the corresponding wall of said drawer, third rod supporting means comprising a third cylindrical sleeve, said third cylindrical sleeve secured on the underside of the apertured fixed cover part substantially perpendicular to the plane thereof and in axial alignment with the vertical aperture therein, the inner end of said third rod being slidably mounted in said third cylindrical sleeve the length of said third rod being such that its outer end extends through the vertical aperture in the fixed cover part to contact the underside of the top of said desk or bureau, and third rod fastening means comprising a set screw in said third cylindrical sleeve, said third set screw arranged to

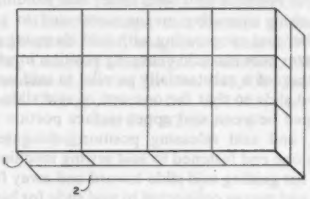
hold said third rod temporarily in its extended position in said third cylindrical sleeve in contact with the underside of the top of said desk or bureau.

4,030,427

ARMOR PLATE

David Goldstein, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 30, 1974, Ser. No. 519,464
Int. Cl.² F41H 5/04
U.S. Cl. 109—82 3 Claims



1. Armor plating comprising:

tiles arranged in an array, comprising titanium carbide particles finely dispersed in a matrix of tough crack resistant titanium-nickel alloy, the titanium carbide particles constituting from 30 to 60 weight percent of the tile and the matrix of titanium-nickel alloy the remainder, the composition of the matrix being from about 44 to about 46 titanium and from about 54 to about 56 nickel by weight percent, provided that the tile has a Rockwell-A hardness of at least 82, and further provided that the tile be at least 1⅛ inches on a side when square and have a diagonal of at least 1 inch when other than square,

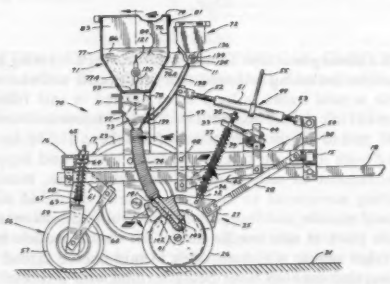
A support layer fastened to the underside of said tiles and being composed of a material selected from the group consisting of (a) woven roving glass reinforced plastic, (b) alloys of aluminum which have a brinell hardness between 80–130, and (c) alloys of titanium which have a Rockwell C hardness of 5–40.

4,030,428

NATIVE GRASS SEED DRILL

James R. Truax, 3717 Vera Cruz Ave., Minneapolis, Minn. 55422

Filed Apr. 29, 1976, Ser. No. 681,596
Int. Cl.² A01C 5/00
U.S. Cl. 111—85 13 Claims



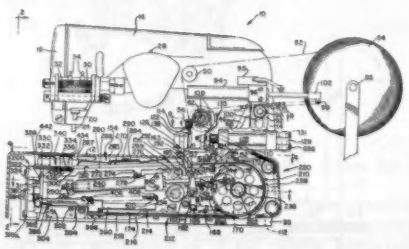
1. An apparatus for planting native grass seed in the soil comprising: a frame, wheels rotatably mounted on the frame for supporting the frame for movement on the soil, a seed box mounted on the frame, said box having side walls and a bottom wall defining a chamber for storing native grass seed, a plurality of dividing plates separating the lower portion of said chamber into a plurality of transversely spaced seed bins, downwardly converging side walls associated with each of the dividing plates to provide each bin with downwardly converging surfaces for directing seeds to the bottom wall of each bin, an elongated discharge slot located in the bottom wall of each bin, flexible means located on the bottom wall in each bin, said flexible means having an elongated opening positioned in vertical alignment with the slot in the bottom wall of the bin, picker wheel means rotatably mounted on the frame, said picker wheel means having upper portions which extend through the discharge slots and elongated openings of the flexible means of each bin for moving seeds from the bins, an agitator unit located in each bin to continuously stir and move the seeds in the bin to keep a supply of seeds in the vicinity of the picker wheel means, each agitator unit having a plurality of paddles operable to agitate the seeds in the bins, said plurality of paddles including first and second end paddles terminating in ends that move adjacent the inclined surfaces of the side wall of each bin, means for rotating the agitator means and wheel means, a plurality of seed funnels attached to the seed box, said seed funnels being located below the bottom wall of the seed box and aligned with each of the wheel means and having a seed passage for receiving the seeds from the picker wheel means, each funnel having a neck surrounding a throat located below the picker wheel means, a plurality of furrow opening assemblies movably mounted on the frame operable to make a furrow in the soil, each furrow opening assembly including a planting shoe and furrow forming means, elongated flexible tubes attached to the outlet necks of the seed funnels and the planting shoes for delivering the seeds from the seed funnels to the planting shoes, said planting shoes having sufficiently large discharge openings for directing the seeds into the furrows.

4,030,429

SEWING MACHINE ATTACHMENT

Ronald J. Boser, Dix Hills, N.Y., and Walter P. Siegel, Lebanon, N.J., assignors to Special Sewing Systems, Inc., New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,350
Int. Cl.² D05B 3/12
U.S. Cl. 112—104 25 Claims



1. Apparatus for feeding labels to a sewing machine, said machine including a work support, feed advancing means, and a stitch forming means, and said apparatus comprising:

label storage means;

means for feeding and cutting predetermined lengths of labels from said label storage means;

means for engaging and folding the label upon itself;

means for orientating and advancing the folded label from an area remote from said stitch forming means to a delivery point; and

transporting means for advancing said folded label from said delivery point under said fabric for presentation to said feed advancing means whereby gripping said folded

label from said transporting means and feeding the same to said stitch forming area where it is attached to a garment being sewn.

4. In combination, a sewing machine including a work support, a sewing needle and feed advancing means defining a sewing station, and a label inserter for inserting a label to the underside of said fabric piece, said label inserter comprising:

a supply roll of ribbon;

means for feeding, cutting and clamping said ribbon into preselected lengths;

means defining a label feed path orientated substantially parallel to said work support;

label engaging and folding means operable to forcibly urge said label along said path whereby locating the folded edge of said label into a first position;

transporter means for receiving said label at said first position; and

means for forcibly moving said transporter means through a feed stroke into close proximity with said sewing station.

4,030,430
APPARATUS FOR SEWING SLIDE FASTENERS TO ELASTIC CARRIERS

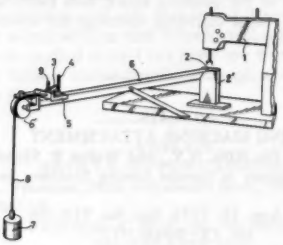
Hansjürgen Pickert, Kerkrade, Netherlands; Hans Dieter Sesselmann, Rodingen, Germany, and Leonardes August Timmers, Mechelen, Netherlands, assignors to William Prym-Werke KG, Stolberg, Rhineland, Germany

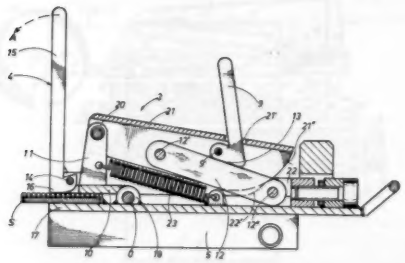
Filed Feb. 18, 1975, Ser. No. 550,489

Claims priority, application Germany, Feb. 16, 1974, 2407558

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.26 **8 Claims**





1. Apparatus for simultaneously sewing two coupled stringers of a slide fastener into portions of a carrier to opposite sides of an elongated slit therein, which is closed at one end, in which the carrier is elastic in the direction of the slit, the apparatus comprising a two-needle sewing machine having a needle plate; a slide having an upper substantially flat surface portion; holding means on said slide for releasably holding the coupled stringers of a slide fastener in the region of one end of the latter and the carrier in the region of its closed end of the slit therein on said slide, said holding means comprising a holding member connected to said slide and having an upright portion adapted to engage the carrier in the region of the closed end of the slit, and clamping means for clamping the slide fastener stringers in the region of said one end, said clamping means being movable between a clamping and a releasing position, and comprising a clamping plate having a bottom face facing said upper surface portion, hinge means connecting said clamping plate to said slide tiltable about an axis substantially parallel to said upper surface portion, a support member projecting upwardly from the clamping plate and having an upper end, a connecting member hingedly connected at one end to upper end of support member, a link pivotably connected at one to said connecting member and at the other end to said slide, a spring connected at opposite end to said support member and said slide, said holding means further comprising operating means connected to said connecting member and cooperating with said clamping plate for moving the latter between said clamping position in which said bottom face thereof is substantially parallel to said upper face portion of said slide so that the one end of said slide fastener may be clamped between said upper surface portion and said bottom face, and said releasing position; elongated guide means having one end fastened to said sewing machine and an opposite end for guiding said slide toward and away from said needle plate; and means connected to said slide for biasing the same with a constant force toward the opposite end of said guide means in a direction opposite to the advance of the slide fastener and the carrier during the sewing operation.

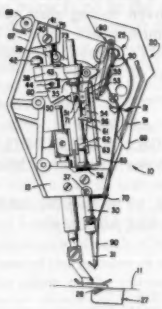
4,030,431
SEWING MACHINE TAKE-UP THREAD SHIELD

Adolph Martin, Rheinstetten-Neu, Germany, and William Joseph Edwards, Cranberry, N.J., assignors to The Singer Company, New York, N.Y.

Filed May 24, 1976, Ser. No. 688,880

Int. Cl.² D05B *49/00*

U.S. Cl. 112—241 **5 Claims**



5. In a sewing machine having a frame, stitch forming instrumentalities including a thread carrying needle endwise reciprocable in said frame, a loop taker carried in said frame for movement in cooperation with said needle to concatenate said needle thread in the formation of stitches, a take-up lever formed with a needle thread engaging eyelet and supported for movement of said eyelet within said frame, means for imparting movement to said take-up lever in timed relation with said needle and loop taker and in a path alternately to provide slack in said needle thread for concatenation by said loop taker and to withdraw slack in said needle thread to set stitches, said take-up lever being formed with a thread introduction slot leading from said eyelet to a mouth which is located externally on said take-up lever and which is accessible to the needle thread when slack is provided therein by the movement of said stitch forming instrumentalities,

means for preventing accidental unthreading of the take-up lever eyelet comprising: a thread shield formed with a take-up lever accommodating passageway having an open

extremity; means for supporting said thread shield on said sewing machine frame with said passageway aligned with the path of motion of said take-up lever, with said thread shield extending between said take-up eyelet and said thread introduction slot mouth over that portion of the path of motion of said take-up lever in which sufficient slack thread is provided in order to make unthreading possible and with said open slot extremity arranged to expose said take-up lever over that portion of the path of motion of said take-up lever in which insufficient slack thread is provided in order to make unthreading possible.

4,030,432

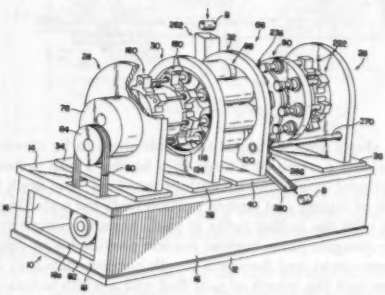
CAN TRIMMING APPARATUS

Stanley J. Miller, Hastings, and Richard J. Heniser, Grand Rapids, both of Mich., assignors to Gulf & Western Manufacturing Company (Hastings), Southfield, Mich.

Continuation-in-part of Ser. No. 543,930, Jan. 24, 1975, abandoned. This application Dec. 5, 1975, Ser. No. 636,978

Int. Cl.² B21D *24/16*

U.S. Cl. 113—7 R **35 Claims**



1. Apparatus for edge trimming the open end of a cup-shaped metal can body comprising, a frame, can body supporting spindle means having a spindle axis, means for supporting and moving said spindle means and a can body supported thereby along an arcuate path relative to said frame, said arcuate path having a second axis radially spaced from and parallel to said spindle axis, cutter means supported by said frame at a location along said path, and means to rotate said spindle means and said can body supported thereby about said spindle axis during movement of said spindle means and can body about said second axis and past said cutter means, said cutter means being positioned on said frame to sever an axial portion from the open end of said rotating can body moving therepast.

4,030,433

METHOD OF FORMING CAPTIVE CAN CLOSURE

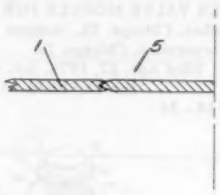
Herbert Arthur Bly, 10 Shadowstone Lane, Lawrenceville, N.J. 08648

Continuation-in-part of Ser. No. 440,739, Feb. 8, 1974, Pat. No. 3,963,153. This application Apr. 5, 1976, Ser. No. 673,612

Int. Cl.² B21D *51/44*

U.S. Cl. 113—121 C **1 Claim**

1. A method of integrally forming a sliding closure member in a can lid by sequential punching and die forming in four steps; firstly, punching said sliding portion, displacing it partially from the container lid, with complete shearing of the metal taking place; and secondly, forming the sheared edge of the closure member between two dies to round the inner and outer edges and extrude the metal, slightly increasing the projected area of the closure; thirdly, repositioning the sliding portion to its original position in the opening while clamping it between two rounded dies to reduce its projected area to that of the opening; and fourthly, forming the edges of the opening between two dies to conform to the rounded edges of the closure, causing extrusion of the edges of said opening, increasing its projected area and causing it to overlap and tightly



seal against the edges of the closure while forming guide grooves for the sliding member, and restoring the plane surface of the container top, further increasing sealing pressure.

4,030,434

VEHICLES OF THE SUBMERSIBLE TYPE

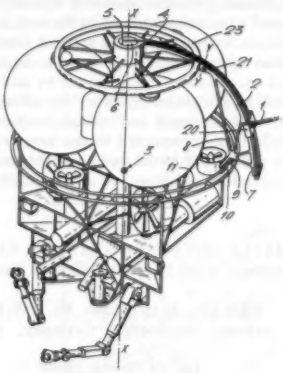
Roy Pedlar; Alan Roderick Spencer, and Colin Edwards, all of Bristol, England, assignors to British Aircraft Corporation Limited, London, England

Filed Mar. 10, 1976, Ser. No. 665,577

Claims priority, application United Kingdom, Mar. 15, 1975, 10916/75

Int. Cl.² B63G *8/00*

U.S. Cl. 114—16 R **4 Claims**



1. A submersible vehicle having anchorage means for a cable link the anchorage means including,

an arcuate trackway formed in two pieces lying generally end-to-end within a plane including an axis passing through the centre of drag of the vehicle when submersed, and together describing an arc centred upon the said centre of drag,

first and second locating means respectively locating the two pieces of the arcuate trackway on the vehicle, said locating means allowing bodily rotation of the arcuate trackway about said axis,

hinge means for hinging the two pieces together, and

trolley means, constrained to move along the arcuate trackway, to which a cable link is attachable, the arrangement being such that the arcuate trackway can rotate bodily about said axis, the trolley means can move along the arcuate trackway under the effect of a tension load in the cable link so that the resultant axis through which this load acts can pass through the centre of drag of the vehicle, and the two pieces of trackway can pivot with respect

to each other to accommodate any irregularities in the locating means.

4,030,435

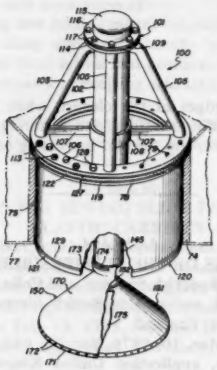
HOPPER VALVE MODULE FOR HOPPER DREDGE

Ezra Sensibar, Chicago, Ill., assignor to Construction Aggregates Corporation, Chicago, Ill.

Filed Apr. 22, 1976, Ser. No. 679,158

Int. Cl.² B63B *35/30*

U.S. Cl. 114—36 **44 Claims**



1. In a hopper dredge vessel having a hopper with an outlet at the bottom thereof, a removable hopper valve module comprising housing means removably mountable on the associated hopper adjacent to the outlet thereof, a valve member movable in use between a closed position closing the hopper outlet and an open position opening the hopper outlet, and drive means carried substantially solely by said housing means and coupled to said valve member for effecting movement thereof between the open and closed positions thereof, said valve module being connected to the associated vessel only adjacent to the hopper outlet and adaptably mounted so as to be readily attached and removed as a unit from the hopper.

4,030,436

FOLDABLE OUTBOARD SEAT FOR SAILBOATS

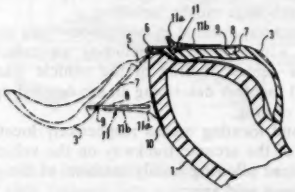
Helmuth Stöberl, 8201 Eggstatt-Bachham Haus near 9, Germany

Filed Oct. 3, 1975, Ser. No. 619,176

Claims priority, application Germany, Oct. 7, 1974, 2447710

Int. Cl.² B63B *29/00*

U.S. Cl. 114—39 **8 Claims**



2. In combination with a sailboat having a hull with a deck well portion for storing an outboard seat, a seat member fitting said well having a back surface portion contoured to lie flush with the deck and a front surface portion contoured to provide a seat, said seat member having a forward edge pivotably connected to the sailboat hull adjacent the outer periphery of the sailboat, a seat bottom portion extending from said forward edge, and an up-standing back rest portion at the outer end of the seat portion, said seat member being pivoted from a storage position in said well inboard of said boat hull to an outboard position projecting laterally from the boat hull with the major portion of the seat bottom portion and all of the back rest portion lying beyond the boat hull.

4,030,437

SHIP'S DOCK

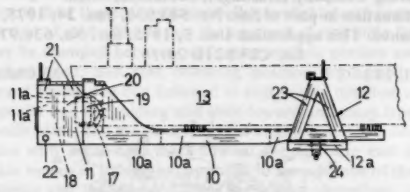
Bo Gunnar Bengtsson, Ockero, Sweden, assignor to Trascandica AG, Basel, Switzerland

Filed Mar. 25, 1976, Ser. No. 670,569

Claims priority, application Sweden, Mar. 27, 1975, 7503600

Int. Cl.² B63C *1/06*

U.S. Cl. 114—46 **7 Claims**



1. A ship's dock arranged to enable work to be carried out on a limited portion of a large ship having a hull defined by conventional length and breadth proportions, said dock being capable of raising said limited portion from the water in cooperation with the ballast tanks in said ship and comprising:

a. an elongate plane bottom portion provided with displacement tanks and having a length corresponding to about one half the length of said hull and a width substantially smaller than the breadth of said hull;

b. a stem portion having displacement and stabilizing tanks, located at one end of said bottom portion, raising above the level thereof and extending over a minor portion of the length of said bottom portion;

c. a separate U-shaped stabilizing body arranged at the end portion of said bottom portion remote from said stem portion, said body having an internal width greater than the breadth of said hull; said body adapted to be removeably secured to said bottom portion.

4,030,438

SHIPS FOR LIQUID CARGOES

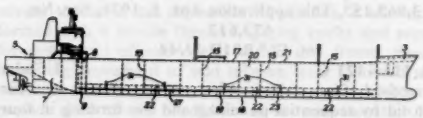
Ian Edmund Telfer, Billericay, England, assignor to The British Petroleum Company Limited, London, England

Filed June 12, 1975, Ser. No. 586,360

Claims priority, application United Kingdom, July 5, 1974, 30017/74

Int. Cl.² B63B *25/08*

U.S. Cl. 114—74 R **11 Claims**



1. In a ship for carrying liquid cargoes having at least two longitudinal bulkheads separating a central tank area from wing tank areas and transverse bulkheads dividing the central and wing tank areas into a number of tanks, the improvement comprising two sets of tanks in each of the wing tank areas, one lower set, suitable for holding ballast, extending beneath the other upper set, suitable for holding cargo, but with the

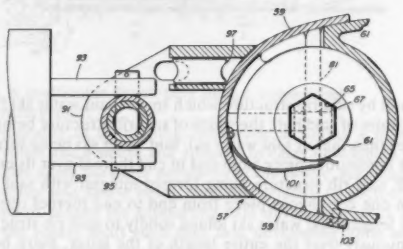
tanks of the lower set having vertical portions extending to deck level and a horizontal flat extending along the length of the wing tank areas between the upper and lower sets of tanks, the flat being solid between the sets of tanks and perforated where it passes through the vertical portions of the lower set of tanks.

4,030,439

BOOM GOOSENECK FITTING PROVIDING MAINSAIL ROLLER-FURLING

Frederick E. Hood; Donald K. Mitchell, and Gary S. Uhring, all of Marblehead, Mass., assignors to Hood Sailmakers, Inc., Marblehead, Mass.

Filed Aug. 30, 1976, Ser. No. 718,949
Int. Cl.² B63M 9/04
U.S. Cl. 114—106 **6 Claims**



1. A roller-furling mainsail rig comprising: A mast having a generally cylindrical sail-receiving compartment and an aft-facing slot through which the mainsail may be drawn from said compartment;

a curved plate conforming to the rear peripheral curvature of the mast cross-section at the lower end of the mainsail slot;

a reel for furling the main sail;

a bracket on the inward side of said plate for rotatably supporting said reel within the mast, said mast being apertured near its base to receive said reel when the plate is mounted to the mast;

a boom provided with means for securing the clew of the mainsail; and

hinge means for mounting said boom on the opposite side of said plate from said reel whereby by mounting said plate on said mast, said roller-furling reel and said boom are in co-operative relationship.

4,030,440

BOAT CLEANING MACHINE

Floyd David Wickersham, R.R. 1, Leesburg, Ind. 46538

Filed Mar. 24, 1976, Ser. No. 670,049
Int. Cl.² B63B 59/00
U.S. Cl. 114—222 **11 Claims**

1. Boat cleaning equipment which comprises:

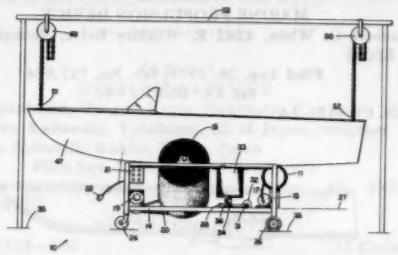
a frame having a first dimension parallel to the longitudinal axis of a boat suspended above it;

bottom-cleaning means mounted upon said frame for cleaning the bottom of a boat, said bottom cleaning means having a bottom cleaning surface at least a portion of which is positioned to contact the bottom of a boat suspended above it, the bottom cleaning surface being movable relative to a boat suspended adjacent thereto and relative to said frame;

first drive means for moving the bottom cleaning surface relative to a boat suspended adjacent thereto and relative to said frame;

side cleaning means mounted upon said frame for cleaning the sides of a boat, said side cleaning means having side cleaning surfaces, at least a portion of which are positioned to contact the sides of a boat suspended above the bottom cleaning surface, the side cleaning surfaces being movable relative to a boat suspended adjacent thereto and relative to said frame;

second drive means for moving the side cleaning surfaces relative to a boat suspended adjacent thereto and relative to said frame; and



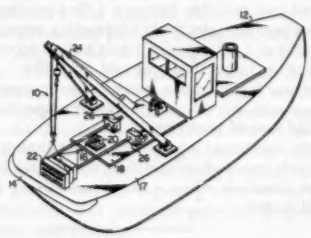
roller means operable on a stationary surface to facilitate moving said frame along the first dimension of said frame parallel to the longitudinal axis of a boat suspended above the bottom cleaning surface.

4,030,441

DEVICE FOR CONNECTING TUGBOAT WITH SHIP TO BE TUGGED

Toshio Nagata, Tokyo; Kunijiro Kawasaki, Sasebo; Ryuichiro Takahama, Sasebo; Yoshifusa Miyatani, Sasebo, and Sozo Funakoshi, Sasebo, all of Japan, assignors to Kohan Sendan Kikai Kabushiki Kaisha; Sasebo Jukogyo Kabushiki Kaisha and Nishi Nippon Harbor Service Kabushiki Kaisha, all of, Japan

Filed Nov. 17, 1975, Ser. No. 632,275
Claims priority, application Japan, Mar. 18, 1975, 50-31852
Int. Cl.² B63B 21/56
U.S. Cl. 114—242 **2 Claims**



1. A device for connecting a tugboat with a ship to be tugged thereby, comprising:

a tug rope which may be paid out from said tugboat, and one end of which is secured to an anchor means mounted on said tugboat;

an electromagnet adapted to secure one end of said tug rope to the hull of said ship and to which is secured the other end of said tug rope; said electromagnet including a casing having a beam member therein, a plurality of magnetic pole members each having a pair of opposing yokes and disposed in two rows in side-by-side relation within said casing, a plurality of electric coils for exciting said magnetic pole members and surrounding all of said yokes of said magnetic pole members, and a plurality of spring assemblies affixing said magnetic pole members to said beam member within said casing; said spring assemblies

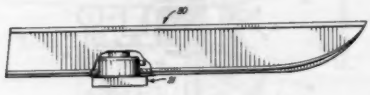
each having a rod pivoted to said magnetic pole member at its one end, and at least one coil spring surrounding said rod and located on said beam member, and elastic deformation of said coil spring permitting the movement of each of said magnetic pole members.

4,030,442

MARINE PROPULSION DEVICE

Herbert O. White, 4242 E. Wilshire Drive, Phoenix, Ariz. 85008

Filed Aug. 26, 1976, Ser. No. 717,604
Int. Cl.² B63H *25/46*
U.S. Cl. 115—14 **7 Claims**



1. A propulsion device for use in combination with a marine vessel, said propulsion device comprising:

a. a housing for attachment to said vessel below the waterline thereof and including a water conducting channel extending through said housing and having first and second open ends,

said channel having first and second water paths defined therein and extending longitudinally through said channel;

b. a propeller for urging water through said channel and journalled within said housing for unidirectional rotation about a normally vertical axis,

said propeller having a first sector described by the cylinder of rotation thereof lying in said first water path and second sector described by the cylinder of rotation thereof lying in said second water path;

c. a first gate pivotally carried by said housing within said channel intermediate said propeller and said first open end and movable between a first position and a second position for selectively obstructing respective said water paths and for exposing water to said second and said first sectors, respectively, of said propeller;

d. a second gate pivotally carried by said housing within said channel intermediate said propeller and said second open end and movable between a first position and a second position for selectively obstructing respective said water paths and for exposing water to said second and said first sectors, respectively, of said propeller;

e. means for operative synchronous movement of said first and said second gates between respective said first and said second positions,

whereby said vessel is propelled in one direction when water is selectively exposed to said first sector and is propelled in a reverse direction when water is selectively exposed to said second sector.

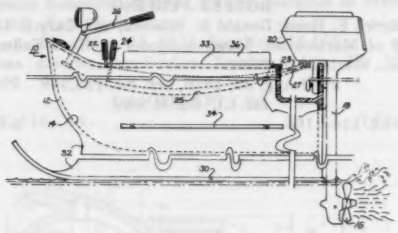
4,030,443

SPORTS WATERCRAFT

Donald C. Price, 23844 Gratiot, East Detroit, Mich. 48205

Filed Mar. 29, 1976, Ser. No. 671,628
Int. Cl.² B63B *35/00*
U.S. Cl. 115—70 **2 Claims**

1. Improvement in sports watercraft having a floatable hull, a propeller means including a rotatable propeller shaft and propeller for propelling said watercraft in water, a motor for driving said propeller, a throttle for controlling the speed of said motor and steering mechanism for rotating the propeller shaft to steer said watercraft in water, said improvement comprising the bottom portion of said hull being rounded in shape like a boat and formed with an exterior radius to provide maximum bouyancy for a given depth of displacement of said hull, the interior of the said hull having a radius with the same center as said exterior radius, said motor and propeller being exterior of said hull, a single water ski disposed beneath and joined to said hull so that at low speeds said watercraft floats in the water by means of said hull and at high speeds said hull is lifted substantially entirely out of the water by means of said water ski, whereby at said high speeds said watercraft rides on top of the water, said hull having a flat deck portion for supporting an occupant of said watercraft in a straddling position, and means on both sides of said hull for supporting the feet of said occupant, a single rib structure, said water ski joined to



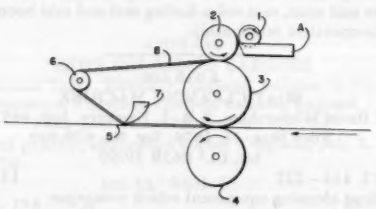
said hull by said rib structure which spaces said water ski from the bottom of said hull, the width of said rib structure being no greater than that of said water ski, said water ski being formed in one continuous piece from end to end thereof over its entire length, said rib structure being formed integral with said hull and in one continuous piece from end to end thereof over its entire length, said water ski joined solidly to said rib structure continuously over the entire length of the latter, there being no break or interruption in either said rib structure or said water ski over the entire length thereof.

4,030,444

CONTINUOUS SILK SCREEN WITH DIRECT ROLL COATER

George L. Collins, Murray Hill, and John R. Costanza, North Plainfield, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,478
Int. Cl.² B05C *1/14*
U.S. Cl. 118—257 **4 Claims**

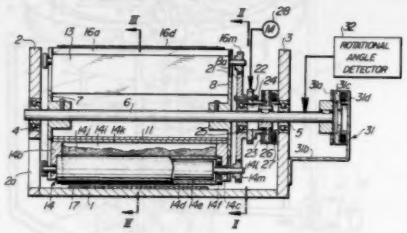


1. In a roll coater having a takeup roll located in a coating bath, a nip roll located adjacent to the takeup roll, providing a sufficient separation between the takeup roll and the nip roll to meter the desired thickness of coating onto the nip roll, and driver rolls interposed on either side of a substrate to be coated, said nip roll located adjacent one of said driver rolls, wherein the driver rolls drive the substrate through the coater, the improvement of which comprises interposing between said one driver roll and the side of the substrate to be coated, a silk screen band which receives the coating from the nip roll, and which band is maintained in contact with the side of the substrate to be coated by a resilient blade located downstream of said driver rolls, wherein the band moves in the direction of flow of the substrate between the driver rolls at a speed equal to the line speed of the substrate.

4,030,445
MULTICOLOR DEVELOPING DEVICE

Hisayoshi Takenaga, and Teruo Yotsukura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 26, 1976, Ser. No. 661,794
Claims priority, application Japan, Feb. 28, 1975, 50-26564
Int. Cl.² G03G *15/08*
U.S. Cl. 118—645 8 Claims

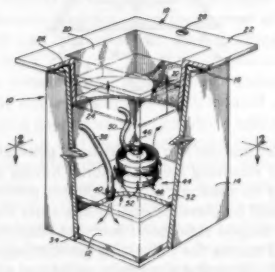


1. A multicolor developing device comprising:
a rotary shaft;
a plurality of developing units each including a magnetic roller and a sleeve and adapted to carry developing particles along the outer periphery of the sleeve, said magnetic roller and sleeve being rotatable relative to each other;
support means for supporting said developing units about the rotary shaft such that said developing units are located radially equidistantly with respect to the axis of rotation of said rotary shaft and are spaced a predetermined distance apart from one another;
a drive gear mechanism comprising a first gear mounted coaxially on the rotary shaft by means of a bearing and adapted to engage in driving relation with either the magnetic roller or the sleeve of the respective developing units, and a clutch adapted to lock the first gear with respect to said rotary shaft; and
braking means for stopping the rotation of said rotary shaft.

4,030,446
DIRECTED FLOW IONIZATION CHAMBER IN ELECTROSTATIC COATING

Allan V. Karr, Stratford, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.

Filed Apr. 30, 1976, Ser. No. 682,183
Int. Cl.² B05B *5/02*
U.S. Cl. 118—654 6 Claims

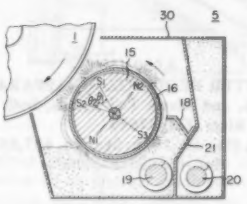


1. Electrostatic fluidized bed coating apparatus comprising, in combination: a housing having a porous support member mounted therein to define within said housing a fluidization chamber thereabove in a plenum therebelow; electrode means having multiple charge-concentrating portions thereon; and means for directing air in a flow path conforming substantially to the form of and into contact with said charge-concentrating portions of said electrode means, to thereby ionize the air, said electrode means and said air-directing means being so disposed as to pass air through said plenum in a flow path from said directing means, into contact with said electrode means, and upwardly through said support member and into said coating chamber, whereby the resultant ionized air may be used to charge and fluidize a particulate coating material supported in said coating chamber on said support member.

4,030,447
DEVELOPING DEVICE

Toru Takahashi, Tokyo; Kimio Nakahata, Kawasaki, and Hidejiro Kadowaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1975, Ser. No. 620,402
Claims priority, application Japan, Oct. 10, 1974, 49-116899
Int. Cl.² G03G *15/09*
U.S. Cl. 118—658 13 Claims



1. A device for developing latent images comprising:
means for supporting a surface having a latent image to be developed;
a container for containing developer therein;
magnetic means supported in said container for producing magnetic fields, said magnetic means having adjacent magnetic poles of identical polarity disposed at a developing position opposed to said surface to be developed, wherein said adjacent poles are vertically spaced; and
a non-magnetic member interposed between said surface to be developed and said magnetic field producing means, said non-magnetic member being movable relative to said magnetic field producing means to convey the developer, attracted thereto by said magnetic fields, from said container to said developing position in magnetic brush form of sufficient height at the developing position to contact said surface, wherein said adjacent poles of identical polarity produce a field therebetween which repels the conveyed developer from the surface of the non-magnetic member at the developing position, and wherein said non-magnetic developer conveying member is disposed to move downwardly at said developing position so that the force of gravity aids the repelling force of the magnetic field between said identical poles to project the developer onto said surface.

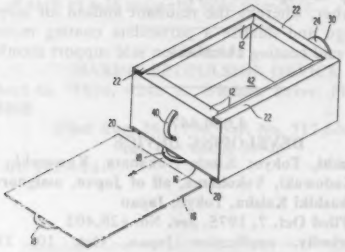
4,030,448
CAT LITTER DISPENSING CONTAINER

Judi Nuttall, 1722 Union Blvd., Allentown, Pa. 18103

Filed Apr. 13, 1976, Ser. No. 676,430
Int. Cl.² A01K *23/00*
U.S. Cl. 119—1 4 Claims

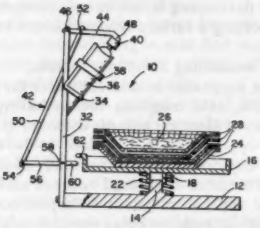
1. A container for cat waste dispensing, comprising:
a. means forming a chamber for containing the cat waste, said means having a plurality of openings communicating with said chamber;
b. closure means for each of said openings;
c. means for engaging said closure means and retaining them with respect to each of said openings to seal off said chamber, said closure means being readily removable to open said chamber and provide access thereto; and

d. said container having an extension forming a narrow neck portion providing a conduit communicating with said



chamber, one end of said extension providing one of said openings.

4,030,449
PET LITTER DEODORIZING APPARATUS
Roy M. Ruddick, and Marie T. Ruddick, both of P.O. Box 1627, Crystal River, Fla. 32629
Filed May 19, 1976, Ser. No. 687,652
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **2 Claims**



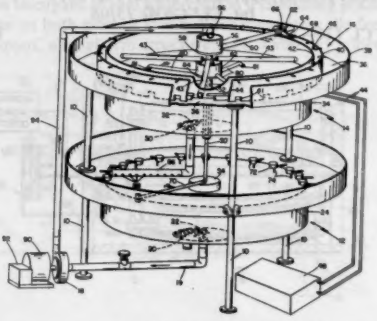
1. Apparatus for deodorizing a pet litter comprising: a base; a platform mounted on said base for vertical movement; spring means acting between said platform and said base for urging said platform to an upper position, said platform adapted to move to a lower position in response to the application of the weight of a pet to said platform, said platform being adapted to carry a pet litter pan thereon; a support projecting upward from said base means on said platform for carrying an aerosol container of deodorant with the actuating valve and nozzle assembly of said container aimed for spraying said deodorant toward said platform; a linkage means carried by said support for actuating said valve and nozzle assembly in response to upward movement of said platform from the lower to the upper position, said linkage means including a feeler adapted to engage said platform when said platform is in a position intermediate said upper and lower positions.

4,030,450
FISH RAISING
David P. Hoult, Wellesley, Mass., assignor to American Fish Company, Wellesley, Mass.
Continuation of Ser. No. 482,751, June 24, 1974, abandoned. This application July 3, 1975, Ser. No. 592,733
Int. Cl.² A01K *61/00*
U.S. Cl. 119—3 **23 Claims**

17. A method of raising food fish over a period of months comprising the steps of:

continuously maintaining said fish for a period of months in a generally uniform volume of water in a tank of uniform volume

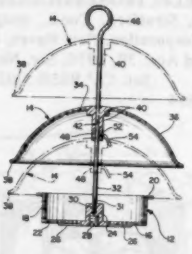
periodically intermittently recirculating said water by removing it from said tank and reintroducing it into said tank in a generally closed system by causing it at intervals



periodically intermittently to flow in said system for increasing lengths of time within said intervals over said period of months as said fish grow in size and

feeding said fish an increasing quantity of food at said intervals over said period of months as said fish grow in size.

4,030,451
BIRD FEEDER
Isobel Miller, Greenville, N.H., assignor to Droll Yankees, Inc., Foster, R.I.
Filed Dec. 1, 1975, Ser. No. 636,553
Int. Cl.² A01K *39/00*
U.S. Cl. 119—51 R **6 Claims**



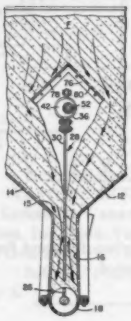
4. A bird feeder and the like comprising a generally circular dish member for receiving feeder material having a base and upstanding sides terminating in a peripheral portion, a rigid rod secured to said base and extending upwardly therefrom, a generally dome-shaped rigid hood member slidably mounted on said rod and means for adjustably positioning said hood member on said rod so that the lower peripheral edge of said hood member may be elevated with respect to said dish peripheral portion or it may be selectively lowered to a position wherein said edge is level with or lower than said peripheral portion, the diameter of said hood peripheral edge being substantially greater than the diameter of said dish, whereby when the lower peripheral edge of said hood member is approximately level with or slightly below said dish peripheral portion, sufficient space exists therebetween for small birds to gain feeding access to said dish member.

4,030,452

FEED DISPENSING HOPPER

Everett M. Keen, and Anthony J. Siciliano, both of Vineland, N.J., assignors to Diamond International Corporation, New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,178
Int. Cl.² A01K 5/02
U.S. Cl. 119—52 B 7 Claims



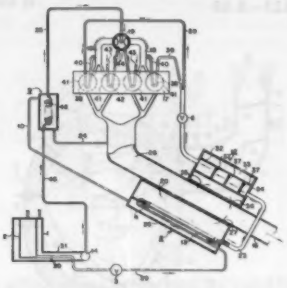
1. A feed dispensing hopper apparatus of the traveling or mobile type for simultaneously dispensing feed into a plurality of feed troughs comprising a plurality of feed discharge outlets spaced apart from each other along a base of a hopper, feed conveying means for simultaneously conveying feed to and out through said outlets, means facilitating the funnelling of feed under gravity toward said conveying means, and means for preventing compacting of feed in the vicinity of said means facilitating the funnelling of feed, said means facilitating the funnelling of feed including downwardly converging wall portions of said hopper apparatus, and said means for preventing compacting of feed including a mouth at the lower end of said downwardly converging wall portions and downwardly diverging extensions from said wall portions down from said mouth whereby feed will tend to descend down to and past said mouth and thereafter will tend to spread out upon descending down past said mouth, said downwardly diverging extensions extending for a significant distance beyond said mouth, said conveying means being located at the bottom of said diverging extensions and just above said base, an agitator supported above said means facilitating the funnelling of feed and extending down through said mouth, between said diverging extensions to just above said feed conveying means, a rotatable shaft extending between upper ends of said downwardly converging wall portions and across other opposite walls of said hopper, a plurality of bearing members fixed on said shaft in eccentric relationship thereto, with said bearing members supporting said agitator in both a suspended and a sliding relationship thereto as said bearing members are rotated with said shaft whereby said agitator is raised and lowered with respect to said shaft by said bearing members, a canopy having at least two downwardly inclined or diverting sides extending at least partly around said shaft and over said agitator, and power transmission means for simultaneously driving said conveying means and said shaft on which said agitator is suspended.

4,030,453

METHOD OF WATER ADMIXING TO FUEL OIL FOR AN INTERNAL COMBUSTION ENGINE AND APPARATUS THEREFOR

Takeshige Sugimoto, 537, Higashikawa, Tosayama, Tosa, Kochi, Japan

Filed Oct. 31, 1975, Ser. No. 627,882
Claims priority, application Japan, July 16, 1975, 50-86206
Int. Cl.² F02B 43/08; F02D 19/00; F02M 31/00
U.S. Cl. 123—3 12 Claims



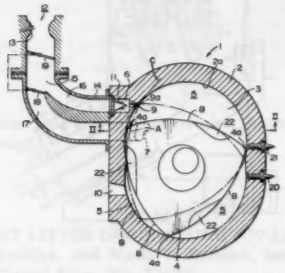
1. In a method for combusting a fuel air mixture in a combustion chamber of an internal combustion engine, the improvement which comprises reducing the amount of fuel consumption necessary for running the internal combustion engine by admixing superheated water vapor which is free of water particles of relatively large sizes with the fuel and air mixture, said superheated water vapor being produced by first heating water in at least one stage at temperatures sufficient to convert it into water vapor and ultimately contacting this water vapor with the heated cylinder head of the internal combustion engine by means of communicating passageways provided in the walls of said heated cylinder head to convert the water vapor to superheated water vapor which is in the state of at least being partially cracked such that the water molecules are partially decomposed to hydrogen plus other gases, separately heating fuel and air at predetermined temperatures to produce vaporized fuel and hot air, mixing the separated heated superheated water vapor, hot air and vaporized fuel and combusting the gaseous mixture thus-formed in the combustion chamber under controlled combustion conditions.

9. In an apparatus for obtaining a fuel mixture to be fed into a combustion chamber of an internal combustion engine, the improvement which comprises water supply means for connecting the water to heating devices, which heating devices are heated by means of the exhaust gases of the internal combustion engine at temperatures sufficient to convert the water to steam, one of said heating devices being such that it contains a plurality of porous metallic catalytic gratings in series having a strong affinity for oxygen by which the steam may be passed therethrough, said gratings being capable of being heated to a red hot state by the exhaust gases so that they serve as a filter to remove the larger droplets of water and part of the oxygen from the steam by a catalytic action, means for transporting the steam to the heated cylinder head of the internal combustion engine, whereby the steam enters the cylinder head by passageways in the walls of the cylinder head and is converted to superheated steam which is in the state of at least being partially cracked such that the water molecules are partially decomposed to hydrogen and other gases, means for heating fuel oil and air separately in a heating device utilizing the exhaust gas of the internal combustion engine as the heat source to produce vaporized fuel and hot air, means for admixing the superheated steam, vaporized fuel and hot air thus-separately heated and means for transferring the gaseous mixture into the internal combustion chamber.

4,030,454
ROTARY PISTON ENGINES

Kenichi Yamamoto; Yutaka Kirose, and Tooru Maeda, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Dec. 11, 1975, Ser. No. 639,705
Claims priority, application Japan, Feb. 28, 1975, 50-25480; Feb. 28, 1975, 50-25481; Apr. 1, 1975, 50-40032; Sept. 29, 1975, 50-118092
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.45 12 Claims



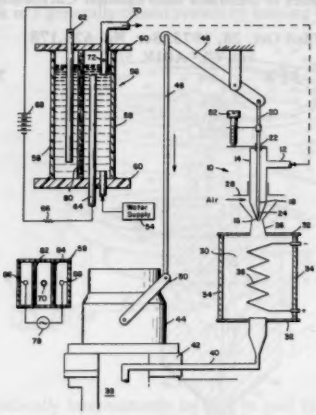
1. Rotary piston engines which comprise a casting including a rotor housing having an inner wall of a multi-lobed trochoidal configuration and a pair of side housings secured to the opposite sides of the rotor housing to define therein a cavity of multi-lobed trochoidal configuration, and a substantially polygonal rotor disposed in said cavity for rotation with apex portions in sliding engagement with the inner wall of the rotor housing so that working chambers of variable volume are defined between the inner wall of the rotor housing and flanks of the polygonal rotor, first intake port means formed in said rotor housing, second intake port means formed in at least one of said side housings and having an effective area which is larger than that of the first intake port means, intake passage means including main passage means, first branch passage means connected at one end to said main passage means and at the other end to said first intake port means, and second branch passage means connected at one end to said main passage means and at the other end to said second intake port means, fuel supply means for supplying fuel to said main passage means, throttle valve means disposed in said main passage means, control valve means disposed in said second branch passage means, control means for closing said control valve means when the opening of said throttle valve means is below a first predetermined value and opening it when said opening of the throttle valve means is above said first predetermined value so that fuel is supplied to said working chamber only through said first intake port means when the opening of said throttle valve means is below said first predetermined value.

4,030,455
ANTIPOLLUTION CARBURETOR DEVICE FOR INTERNAL COMBUSTION ENGINES

Philippe F. Van Eeck, 11827 Kearsarge St., Los Angeles, Calif. 90049

Continuation-in-part of Ser. No. 366,270, June 4, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,716
Int. Cl.² F02D *19/12*
U.S. Cl. 123—25 E 23 Claims

1. In an internal combustion engine, the improvement in improving the combustion of a hydrocarbon fuel-air mixture in the engine comprising means for defining a water-soluble catalytic agent and means for supplying water with said catalytic agent means dissolved therein from a source to the fuel-air mixture prior to supply thereof to the engine for enhancing

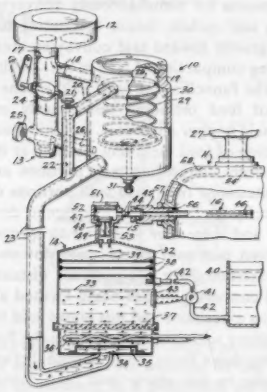


combustion of said hydrocarbon fuel and for controlling the products of combustion thereof.

4,030,456
VAPOR INJECTOR FOR INTERNAL COMBUSTION ENGINES

Daniel J. M. Corpus, 7181 Ridgedale Lane, Lambertville, Mich. 48144

Filed Nov. 5, 1975, Ser. No. 629,096
Int. Cl.² F02D *19/00*
U.S. Cl. 123—25 B 6 Claims



1. An improved vapor injector for an internal combustion engine comprising, in combination, nozzle means for injecting vapor into the engine, means for generating vapors for injection into the engine, means for drawing air through said vapor generating means whereby such air becomes mixed with vapors, means for supplying such air-vapor mixture to said nozzle means, said vapor generating means including housing means for holding a body of vapor generating liquid, means for supplying air to the bottom of such body of liquid, such air bubbling upwardly through such body of liquid, means for heating such liquid and air as such air bubbles upwardly and such liquid and porous means for dispersing such air into small

bubbles as such air bubbles upwardly in such liquid, and valve means for controlling the flow of air to said vapor generating means in response to the load requirements of the engine, wherein said valve means includes first and second separate air passages between an air inlet and said vapor generating means, needle valve means for limiting air flow through said first passage, throttle valve means for controlling air flow through said second passage, and means for controlling said throttle valve means along with an engine control throttle whereby said second passage is substantially closed when the engine throttle is closed and said second passage is opened as the engine throttle is opened.

4,030,457

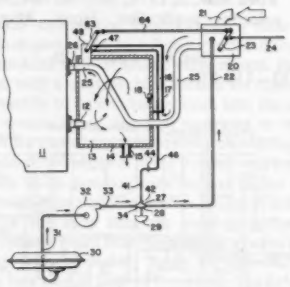
VAPOR CARBURETOR

Peter Hawryluk, Saskatoon, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 21, 1975, Ser. No. 624,534

Int. Cl.² F02M *13/02*

U.S. Cl. 123—34 A **1 Claim**



1. A fuel feed system for an internal combustion engine which selectively heats the fuel supply line and the air supply line prior to mixture of the fuel air intake of the engine, comprising

an internal combustion engine fitted with a carburetor fed by a first fuel line from a fuel pump and an air intake, joined to a fuel-air engine intake pipe,

a first chamber, the interior of which is supplied by exhaust gas from said engine, with the said fuel-air intake pipe led through said first chamber to the intake duct of said engine.

a second fuel line joined by a valve to the first fuel line by a remote-controlled valve which serves to channel the flow of fuel from the fuel pump alternately into said first fuel line or into said second fuel line,

a second chamber, the interior of which is joined by thermostatic valve control means to the interior of the first chamber, with the said second fuel line led through said second chamber to a regulating valve joining said second fuel line to the fuel-air intake pipe at a location adjacent the outlet end of said first fuel line in said first chamber, such that air in the fuel-air intake pipe may be heated independently and at a different temperature from the fuel in the second fuel line and such that fuel in the second fuel in the second fuel line and such that fuel in the second fuel line will be admitted into the fuel-air intake pipe through the regulating valve after both the fuel and the air have been independently heated.

4,030,458

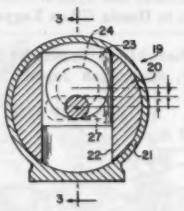
ROTARY PISTON ENGINE

August Uno Lamm, 365 Moseley Road, Hillsborough, Calif. 94010

Continuation of Ser. No. 383,802, July 30, 1973, abandoned, and a continuation-in-part of Ser. No. 264,807, June 21, 1972, Pat. No. 3,799,035, which is a continuation of Ser. No. 878,637, Nov. 21, 1969, abandoned. This application Jan. 29, 1975, Ser. No. 544,870

Int. Cl.² F02B *57/02*

U.S. Cl. 123—44 D **5 Claims**



1. A rotating piston engine comprising the combination of: a stator; a rotor mounted in the stator for rotation about a first axis; means forming a cylinder in the rotor and having its longitudinal axis perpendicular to said first axis; a crankshaft having a first crank with a given throw radius; the crankshaft being mounted in the stator for rotation about a second axis parallel with the first axis and spaced therefrom a distance equal to the throw radius; means forming an elongate opening in said rotor to allow free entry of said crankshaft into said cylinder means, said opening having a length extending laterally of the cylinder and a width extending lengthwise thereof; said crankshaft including an entry portion projecting through said opening means, said entry portion having a cross section which extends from the rotational axis of the shaft more in other directions than towards the axis of said first crank, said entry portion cross section being sized commensurate with the width of the opening for movement along its length.

4,030,459

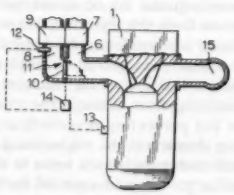
MULTICYLINDER ENGINE

Kenji Hori, Nagaokakyo, and Shigeo Nakamura, Joyo, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 645,296

Int. Cl.² F02B *75/18, 75/10*

U.S. Cl. 123—52 M **9 Claims**



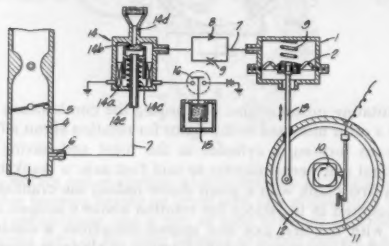
1. Multicylinder engine, characterized in that it comprises a cylinder for over-concentrated mixed gas and a cylinder for under-concentrated mixed gas, a suction manifold for over-concentrated mixed gas, of which one end is connected with a forming device for over-concentrated mixed gas to supply the mixed gas to said cylinder for over-concentrated mixed gas, a suction manifold for under-concentrated mixed gas, of which one end is connected with a forming device for under-concentrated mixed gas to supply the mixed gas to said cylinder for under-concentrated mixed gas, a manifold communicating

hold provided between said two suction manifolds, an opening and closing valve provided in said communication hole, and a detector for detecting the speed of revolution of the engine and a detector for detecting the negative pressure of the manifold to operate said valve, wherein said valve is opened to open said communication hole when the engine is operating at a heavy load or at a high rotational speed.

4,030,460
IGNITION TIMING CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Minoru Tanaka, Chofu, and Syoichi Otaka, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1975, Ser. No. 634,154
Claims priority, application Japan, Nov. 28, 1974, 49-143093[U]
Int. Cl.² F02P 5/14
U.S. Cl. 123—117 A 2 Claims



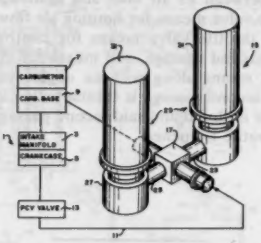
1. For use with an internal combustion spark ignition engine connected to drive a vehicle through an automatic transmission having a torque converter or fluid coupling, the engine including an intake passage, a throttle valve in said intake passage, and a distributor having a movable spark adjusting base, ignition timing control apparatus for the engine comprising, in combination: a vacuum actuator having a movable wall connected to the spark adjusting base, a spring urging said movable wall toward a spark advance position, an increase of vacuum intensity in said vacuum actuator moving said movable wall toward a spark retard position against said spring, a conduit connecting the vacuum actuator to said intake passage of the engine downstream from said throttle valve, a selector valve in said conduit having a valve element movable to connect the vacuum actuator to either the engine intake passage or to atmosphere, a member responsive to engine temperature connected to operate the selector valve to cause said vacuum actuator to be connected to atmosphere when the engine temperature is below a predetermined value or to cause said vacuum actuator to be connected to the intake passage downstream from the throttle valve when the engine temperature is above said predetermined value, a check valve and a restricted orifice mounted in parallel in said conduit between the selector valve and the vacuum actuator, said check valve permitting flow through the conduit from the vacuum actuator but preventing reverse flow, whereby a reduction of vacuum intensity in the engine intake passage when the engine is warm causes said check valve to close and causes the restricted orifice to delay advance of the ignition timing, but an increase of vacuum intensity in the engine intake passage causes an immediate retarding of the ignition timing.

4,030,461
INTERNAL COMBUSTION ENGINE DEVICE

Melvin L. Polette, 2223 Wilding Drive, Overland, Mo. 63114

Filed Apr. 29, 1976, Ser. No. 681,453
Int. Cl.² F02M 25/06
U.S. Cl. 123—119 B 9 Claims

1. In an internal combustion engine system including an air inlet manifold, a carburetor for admitting air to the manifold, a crankcase, a tubular connection from the crankcase to deliver gases from the crankcase to the inlet of the engine, said tubular connection having in it a pollution control valve, the improvement comprising a device connected in the tubular connection between the pollution control valve and the inlet,

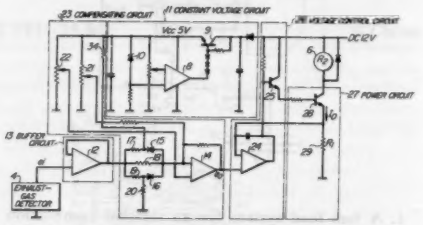


said device including restriction means connected in series in said tubular connection between said pollution valve and said inlet; a closed valve chamber; passage means between said restriction and said closed valve chamber; and balanced movable valve means for variably restricting said passage means.

4,030,462
AIR-FUEL RATIO CONTROLLER FOR INTERNAL-COMBUSTION ENGINE

Takao Sasayama, Hitachi, and Torazo Nishimiya, Mito, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 5, 1976, Ser. No. 664,383
Claims priority, application Japan, Mar. 10, 1975, 50-28057
Int. Cl.² F02N 3/00
U.S. Cl. 123—119 EC 5 Claims



1. An air-fuel ratio controller for an internal-combustion engine comprising air-fuel mixture supply means for changing the air-fuel ratio of the mixture being fed to the engine in response to an input signal, means for conducting the air-fuel mixture from the supply means to the engine cylinders, catalyst means for removing harmful constituents from the exhaust gases, an exhaust pipe for conducting the exhaust gases from the engine to the catalyst means, a detector installed on the exhaust pipe to detect the conditions of the exhaust gases, said detector having output characteristics such that, centering around a first range of actual air-fuel ratio of the mixture being fed to the engine, there are a first region where the output sharply varies away from either side of the first range and a second region where the variation in output is moderate a certain value away from the first range, means for outputting a first signal inversely proportional to the rate of output variation relative to the first region of air-fuel ratio in the output characteristics of the detector, means for outputting a second signal inversely proportional to the rate of output variation relative to the second regions of air-fuel ratio in the output characteristics of the detector, said first and second signal outputting means both serving as means for compensating the output of the detector, first connector means for connecting the output of the detector with the inputs of the first and second signal outputting means which serve the compensating means, and second connector means for applying the output

of the compensating means to the input of the air-fuel mixture supply means.

4,030,463

INTERNAL COMBUSTION ENGINE WITH RETURN LINE FOR EXHAUST GASES

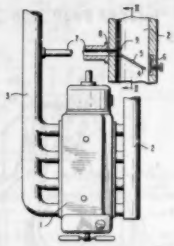
Jurgen Frey, Stuttgart; Andreas Weber, Lorch, and Adolf Triffterer, Nurtingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Aug. 2, 1974, Ser. No. 494,761

Claims priority, application Germany, Aug. 4, 1973, 2339626

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **19 Claims**



1. An internal combustion engine with a return line for returning exhaust gases from an exhaust system of the engine to an inlet line provided with a throttle valve means, the inlet line being provided with a control cross-section for controlling the exhaust gas quantity to be conducted back into the engine, the control cross section being disposed upstream of the throttle valve means with a closed and substantially closed throttle valve and being disposed downstream of the throttle valve means with an open throttle valve means, characterized in that the return line means terminates in a control orifice disposed in the control cross section of the inlet line, the control orifice directly supplying the exhaust gases from the exhaust system to the inlet line such that with a slightly open throttle valve means corresponding to a partial load of the engine the exhaust gases from the exhaust system are supplied from said control orifice directly into the control cross-section of the inlet line whereby the exhaust gases are intermixed with inlet gases at the throttle valve means with the quantity of the exhaust gas flow into the control cross-section being solely determined by the position of the throttle valve means and the configuration of the control orifice.

4,030,464

FUEL-AIR MIXTURE HEATING DEVICE FOR USE WITH INTERNAL COMBUSTION ENGINE

Shunzo Yamaguchi, Nishio; Tadashi Ozaki, Gamagori, and Toshiaki Konomi, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 27, 1974, Ser. No. 527,762

Claims priority, application Japan, Dec. 7, 1973, 48-137175; Apr. 23, 1974, 49-46150

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 AC **12 Claims**

1. In an internal combustion engine including an intake pipe and an exhaust pipe,

a system for heating the intake pipe of the internal combustion engine comprising:

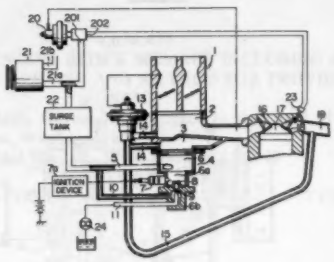
a combustion equipment disposed adjacent to said intake pipe for heating the same, and including a combustion chamber for burning an air-fuel mixture therein, and an ignition device disposed in said combustion chamber for igniting the air-fuel mixture;

air supply means for supplying air to said combustion equipment;

fuel supply means for supplying fuel to said combustion equipment, the amount of fuel being in proportion to the amount of air supplied to said combustion equipment;

pipe means provided between said intake pipe of said internal combustion engine and said combustion equipment for operatively communicating said combustion equipment with said intake pipe; and

valve means disposed in said pipe means for opening the passage of said pipe means to thereby communicate said



combustion equipment with said intake pipe and for keeping the pressure in said combustion chamber around atmospheric pressure to enable the stable combustion of said air-fuel mixture in said combustion chamber, said valve means responding to at least one of the parameters representing the operating conditions of said internal combustion engine to control the opening degree of said passage, whereby the amount of burned gas in said combustion equipment to be supplied to said intake pipe through said pipe means is controlled to enable the optimum combustion of the air-fuel mixture in said combustion equipment.

4,030,465

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Tatsuro Nakagami, Kyoto, and Yuhiko Kiyota, Nagaokakyo, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1976, Ser. No. 718,196

Claims priority, application Japan, Oct. 22, 1975, 50-127806

Int. Cl.² F02M *13/06*

U.S. Cl. 123—127 **14 Claims**

1. A multi-cylinder internal combustion engine comprising:

a. a plurality of cylinders;

b. a carburetor for feeding a lean gaseous mixture of fuel and air to said plurality of cylinders and having an air intake with a Venturi portion and a throttle valve therein;

c. an intake manifold having branches connected between said carburetor and said cylinders for distributing the lean gaseous mixture from said carburetor to all said plurality of cylinders; and

d. fuel adding means for feeding a rich gaseous mixture of fuel and air to some of said branches of said intake manifold, said fuel adding means having:

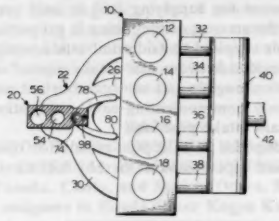
d_1 . an air passageway device having an upstream end and having an orifice at said upstream end communicated with the atmosphere and having a downstream end communicated with the manifold branches for said some of cylinders;

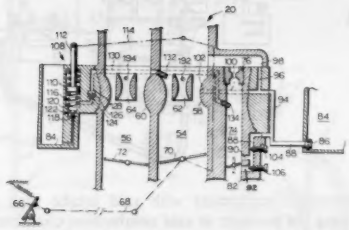
d_2 . a throttle valve device in said air-passageway device between the upstream end and the downstream end;

d_3. a fuel feed passageway communicated with said air passageway device both on the upstream side and on the downstream side of said throttle valve device;

d_4. a fuel source connected to said fuel feed passageway; and

d_3. an air passageway connected between a middle por-





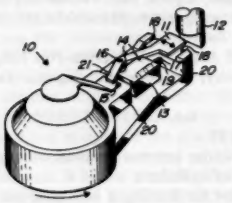
tion of said fuel feed passageway and the Venturi portion of said carburetor.

4,030,466

SYNCHRONOUS ROTOR INDEXING MECHANISM

Melvin Arthur Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1974, Ser. No. 537,748
Int. Cl.² F22B 7/06
U.S. Cl. 123—146.5 A **1 Claim**



1. In a voltage distribution system of an internal combustion engine, the engine having spark plugs and a crankshaft, the distribution system having a housing, a device for synchronously indexing the distribution system, the device comprising:

a shaft rotatable in response to the rotation of the crankshaft of the combustion engine,

an insulating element fixedly mounted on the shaft,

contact means comprising a contact arm pivotably mounted on the insulating element for supplying high voltage pulses and having an outer end free,

a multiplicity of terminal means for receiving the high voltage pulses, the terminal means being mounted in the housing of the distribution system and being connected to the spark plugs,

a weight mounted on the insulating element for radial motion outward under centrifugal force and adapted to coact with a portion of the contact means, causing the contact means to advance relative to the insulating means, and wherein said contact portion and said weight comprise a rack-and-pinion mechanism for causing the contact arm to coact with the weight; and

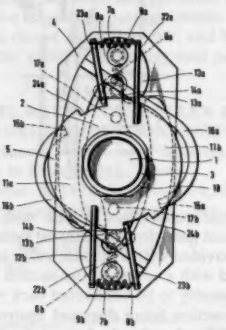
yielding means to oppose the outward motion of the weight, whereby the high voltage pulses are indexed to the proper terminal means at the firing time of time of the high voltage pulses for efficiently firing the combustible mixture in an engine cylinder.

4,030,467

CENTRIFUGAL ADJUSTING MECHANISM FOR IGNITION INTERRUPTERS OF INTERNAL COMBUSTION ENGINES

Ekkehard Schild, Ingolstadt, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Germany

Filed Aug. 4, 1975, Ser. No. 601,662
Claims priority, application Germany, Aug. 16, 1974, 2439366
Int. Cl.² F02P 5/06
U.S. Cl. 123—146.5 A **11 Claims**



1. A centrifugal force adjusting mechanism for ignition contact breakers of internal combustion engines, which includes a plurality of co-axial main structural parts rotatable with respect to one another and flyweights operative to rotate said main structural parts against spring forces to effect advance and delay adjustment in a plurality of rotational speed ranges, characterized by a pair of said flyweights supported at a first of said main structural parts, each flyweight of said pair having first abutment surface means being in driving abutment against first counter surface means on a second of said main structural parts in at least a first rotational speed range to effect relative rotation of said main structural parts in a first direction of adjustment, and each flyweight of said pair being associated with second abutment surface means adapted to drivingly abut second counter surface means on a third of said main structural parts only in a second rotational speed range to effect relative rotation of said main structural parts in a second opposite direction of adjustment.

4,030,468

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Noboru Sugiura, Ibaraki; Yasunori Mori, Hitachi, and Seiji Suda, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 18, 1976, Ser. No. 667,952
Claims priority, application Japan, Apr. 2, 1975, 50-39154
Int. Cl.² F02P 1/00
U.S. Cl. 123—148 E **6 Claims**

1. In an ignition system for internal combustion engines comprising:

an ignition coil having at least a primary winding,

a first transistor with a base, collector and emitter,

a direct potential source,

impedance means,

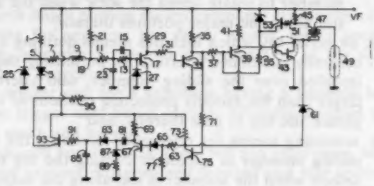
first connecting means for connecting said primary winding

of the ignition coil, said collector and emitter of said first transistor and said impedance means in series across said direct source,

means for producing an alternating signal voltage in synchronism with an engine rotation,

first control means having a predetermined operating voltage level for controlling the base current of said first transistor on the basis a relationship between the operating voltage level and the alternating signal voltage, and

second control means for controlling the base current of said first transistor in response to a voltage across said impedance means to suppress primary current of said ignition coil to a predetermined value, the improvement which comprises



first detecting means for detecting a duration during which said first transistor operates in a non-saturated region, and

third control means for controlling the relation between the operating voltage level of said first control means and the alternating signal voltage in response to an output of said first detecting means, wherein the operating voltage level of said first control means shifts with respect to the alternating signal voltage in accordance with the non-saturated operating duration of said first transistor, for controlling the conduction starting time for the primary current of said ignition coil so as to decrease the non-saturated operating duration of said first transistor.

4,030,469

ELECTRONIC IGNITION CIRCUIT

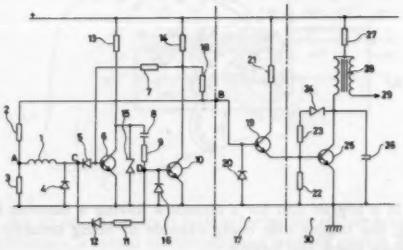
Louis Chateau, Rosny-sur-Bois, France, assignor to Ducellier & Cie, Paris Cedex, France

Filed Nov. 26, 1975, Ser. No. 635,359

Claims priority, application France, Dec. 12, 1974, 74.40897

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 E **5 Claims**



1. An electronic ignition circuit, particularly for the internal combustion engine of a motor vehicle, comprising the combination of a detector winding, a first transistor having its base connected via a first diode to one end of the detector winding, a second diode connecting said one end of the detector winding to an earth, a second transistor connected to control a power output stage for producing spark impulses, first and second resistors in series between a point in the power output stage and earth, the opposite end of the detector winding being connected to the junction of said first and second resistors, a capacitor, third and fourth resistors and a third diode connected in series between the collector of said transistor and said one end of the detector winding, the base of said second transistor being connected to the junction of the third and fourth resistors, and the first, second and third diodes being connected with their cathodes towards said one end of the detector winding whereby, in use, when the voltage at said one end of the detector winding is even weakly negative with respect to that at said opposite end thereof the first transistor is turned off so that said capacitor charges to turn on the second transistor and trigger the power output stage into producing a spark.

4,030,470

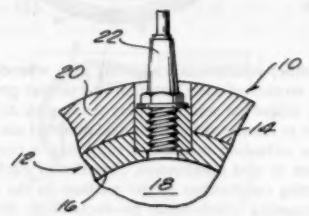
LINED ENGINE BLOCK MEMBER INCLUDING A THREADED OPENING AND METHOD FOR PROVIDING SAME

E. Douglas Betts, Gurnee, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 12, 1974, Ser. No. 531,920

Int. Cl.² F02F *1/08*

U.S. Cl. 123—193 C **7 Claims**



1. An engine block member defining a portion of a combustion chamber including a liner having an outer surface and an inner surface forming at least a portion of an interior wall of the combustion chamber, first and second concentric apertures in said liner, said first aperture extending entirely through the thickness of said liner from said outer surface to said inner surface, said second aperture having an inner dimension larger than the inner dimension of said first aperture, extending from said liner outer surface, and terminating short of said liner inner surface, an insert fitting tightly inside said second aperture and including an internally threaded opening for threadably receiving a part adapted to communicate with said combustion chamber, and an outer body cast substantially continuously along said liner outer surface and along at least a part of said insert.

4,030,471

OPPOSED PISTON ENGINE

Frank Ginkel, 2611 Reed Road, Escondido, Calif. 92025

Filed Oct. 29, 1975, Ser. No. 626,660

Int. Cl.² F02B *57/00, 75/32*

U.S. Cl. 123—197 R **19 Claims**

1. An internal combustion engine comprising:

a first member including a cylinder,

a second member,

means supporting said members for relative rotation on a transverse axis of said cylinder,

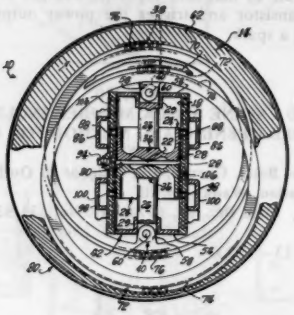
a piston in each cylinder having an outer end extending through one end of the cylinder and an opposite inner end,

each piston being movable in its cylinder through inward compression and outward power strokes and each cylinder containing a combustion chamber at the inner end of the corresponding piston which undergoes contraction during the compression strokes and expansion during the power strokes of the piston,

a circular cam ring surrounding each cylinder endwise with the central axis of the ring parallel to and spaced laterally from said member rotating axis,

bearing means rotatably mounting each cam ring about its circumference on said second member for relative rotation of the ring and second member on the axis of the ring,

means pivotally connecting the outer end of each piston to the corresponding cam ring on a pivot axis parallel to said



member rotation axis and ring axis, whereby reciprocating motion of each piston in its cylinder produces a driving torque on said members tending to drive said members in relative rotation on said member rotation axis, and

engine actuating means for supplying a combustible medium to said combustion chamber of each cylinder, effecting combustion of the medium in the chamber, and exhausting combustion products from the chamber in timed relation to the strokes of the corresponding piston to drive the latter through its power strokes.

4,030,472

AERIAL TOY AND LAUNCHING STICK APPARATUS

Michael L. Watkins, 12542 Euclid St., Garden Grove, Calif. 92640

Filed June 16, 1976, Ser. No. 696,493
Int. Cl.² F31B *3/04*
U.S. Cl. 124—5 **9 Claims**

1. An aerial toy and launching apparatus which comprises:

a. an elongate toy launching stick having a gripping end and an opposite toy launching end,

said stick being formed with at least major portions adjacent the launching end having a generally uniform cross section and including means defining a generally helical guide about the periphery of the stick along said major portions,

b. a stop disposed at the launching end of the stick and fixed relative thereto,

said stop having portions projecting radially outwardly beyond adjacent surfaces of the stick,

c. a sliding member of generally tubular configuration and having inner dimensions slightly larger than outer dimensions of said major portions of the stick, for permitting sliding therealong, and less than those of the radially projecting portions of the stop, for preventing the member from sliding therepast,

said sliding member including guide following means on inner portions thereof for constraining the member to follow said helical guide and for thereby causing the member to rotate about the stick when the member is slid along the major portions thereof,

d. an aerial toy which includes means defining a generally centrally positioned aperture for permitting the toy to be installed over the sliding member, said aperture being larger than the radially projecting portions of the stop to permit the toy to pass thereby, and

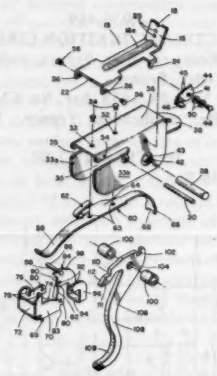
e. mounting means for releasably mounting the toy to the sliding member in a manner causing the toy to move in unison when the member is slid along the major portions of the stick and for then releasing the toy from the sliding member, to cause launching thereof from the stick, in response to the sliding member being abruptly stopped by said stop at the launching end of the stick.

4,030,473

CROSSBOW TRIGGER

John W. Puryear, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed June 25, 1975, Ser. No. 590,378
Int. Cl.² F41C *19/00*
U.S. Cl. 124—35 R **10 Claims**



1. In a trigger unit for a crossbow having a biasable bowstring, the trigger unit being capable of being secured to a crossbow stock and having:

a. a U-shaped housing with a top, left and right sides, interior and exterior protions, and forward and rear sections;

b. sight means movably attached to the forward section's exterior portion;

and each of the following pivotably mounted in the housing interior:

c. sear means for releasably holding a bowstring;

d. finger lever means in the rear section of the housing for releasably locking the sear means;

e. safety means for limiting the rotational movement of the

finger lever means, the safety means having a safety position notch;

the improvement comprising only one unitary, leaf-type spring, and no coiled springs, for performing the functions in (1), (2), (3), (4), and (5) below and having:

1. a center portion atached to the top of the trigger housing;
2. a first finger portion means extending forward beyond the housing's forward section for clamping a crossbow bolt in a predetermined position on the stock;
3. a second finger portion means extending forward beyond the housing's forward section and folding back upon itself across the forward section's exterior portion for continuously biasing the movable sight means;
4. a third finger portion means extending rearward for continuously biasing the finger lever means; and
5. a fourth finger portion means extending rearwardly of the housing for engaging the safety means' safety position notch, whereby accidental disengagement of the safety means is prevented.

6. In a trigger unit for a crossbow having a biasable bowstring, the trigger unit being capable of being secured to a crossbow stock and having;

a. a U-shaped housing with a top, left and right sides, interior and exterior portions, and forward and rear sections;

b. sight means movably attached to the forward section's exterior;

and each of the following pivotably mounted in the housing interior:

c. sear means for holding a bowstring;

d. finger means lever in the rear section for controlling the sear means' movement;

e. safety means for preselectively restraining the firing lever's movement, the safety means having a position notch;

the improvement comprising:

flat bolt stop plate means, on the sear means, for automatically providing a uniform preselected space between the end of a crossbow bolt and a portion of the bowstring, in its biased position, intended to strike the bolt's end when the bowstring is released.

4,030,474

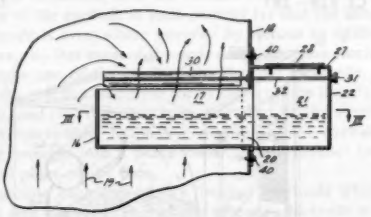
AIR TREATING DISPENSER

Harold Ben Brown, 2951 Village Drive, Marietta, Ga. 30062

Filed Oct. 8, 1975, Ser. No. 620,549

Int. Cl.² F24F *3/14*

U.S. Cl. 126—113 **2 Claims**



1. An air odor treatment system for buildings comprising: in combination, a forced air temperature treating system including a central air temperature treating unit discharging to a plenum, the plenum discharging to a plurality of air ducts delivering treated air to various areas within a building structure, an evaporation unit carried by the plenum with an open topped evaporation tray interior of the plenum, a reservoir and filling chamber exterior of the plenum, the reservoir having a closable opening thereto located exterior of the reservoir, the tray and chamber being in liquid flow communication through an opening in a wall of the plenum, the tray and chamber at least partially filled with a liquid consisting essentially of a mixture of odorants, odor neutralizers and a hydrocarbon solvent, the mixture being evaporatable within the plenum and having a boiling point above a maximum temperature within the plenum at a normal operation, at least one air control vane positioned interior of said plenum adjacent the open top of said tray, said air control vane being carried by said evaporation unit, means allowing adjustment of the attitude of said vane with respect to the open top of said tray, said means including a manually actuatable control located exterior of said plenum, and said vane effective to vary the evaporation rate of the liquid within the tray by modifying the air flow within the plenum whereby the amount of liquid evaporated into the air discharging from the plenum is controllable within a range by manually repositioning the attitude of the air control vane.

4,030,475

FIREPLACE

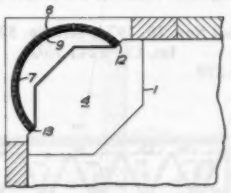
Knut Tronstad, Oslo, Norway, assignor to Aksjeselskapet Jotul, Oslo, Norway

Filed Oct. 8, 1975, Ser. No. 620,710

Claims priority, application Norway, Dec. 4, 1974, 744381

Int. Cl.² F24B *7/00*

U.S. Cl. 126—121 **6 Claims**



1. A fireplace insert including a housing defining a fireplace opening, a rear wall opposite said opening, means defining a room behind said rear wall and a vertically extending opening at one end of said room, and a fireplace screen disposed within said room, said screen being movable from a first position substantially wholly disposed within said room and through said room opening to a second position substantially wholly exposed in and substantially wholly closing said fireplace opening, said room being defined by at least one vertically extending wall substantially semi-circular in shape in a longitudinal direction, said fireplace screen lying generally concentrically with the latter wall, said screen in its first position lying substantially wholly behind said rear wall, said rear wall and said one wall being longitudinally spaced one from the other and defining an air duct in said insert for circulation of air.

4,030,476

HEATED CABINET FOR FOOD

Lester R. Hock, Hacienda Heights, Calif., assignor to Bevles Co., Inc., El Monte, Calif.

Filed Mar. 5, 1976, Ser. No. 664,153

Int. Cl.² A47G *23/04*; **F24C** *15/18*

U.S. Cl. 126—246 **11 Claims**

1. A cabinet for holding heated food comprising:

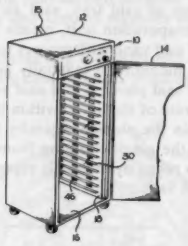
a housing defining an interior;

blower means for circulating air within said interior, coupled to said housing;

heater means coupled to said housing for heating said circulating air; and

closed air distribution means, for directing heated air from said blower means past food in said interior, said distribution means including at least one inlet plenum communicating with said blower means and having a plurality of graduated openings for distributing heated air into said interior, said openings being graduated such that the area

defined by said openings increases with increased distance from said blower means;



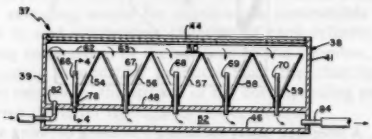
whereby an even distribution of heated air throughout said interior of said cabinet is achieved assuring that all the food in said cabinet is maintained uniformly heated.

4,030,477

SOLAR COLLECTOR WITH CONICAL ELEMENTS

Philip D. Smith, 385 Camelback Road, Pleasant Hill, Calif. 94523

Filed Nov. 20, 1974, Ser. No. 525,583
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **3 Claims**



1. A device for collecting energy from a source of radiant energy, including the combination of means forming a conical ray reflecting surface which diverges outwardly from an apex toward a collecting end through which rays of the radiant energy are received, said reflecting surface being adapted to reflect said rays toward a focal axis which extends through the apex, an elongate energy absorbing structure mounted radially within the conical surface and extending along said focal axis, said structure comprising an elongate hollow enclosure having an open front end facing in the direction at which the reflecting surface diverges and an open rear end facing in the direction of the apex, said structure including an outer surface adapted to absorb the radiant energy of said reflected rays, a plurality of cells mounted within the enclosure, said cells having a hexagonal cross-sectional configuration whereby the plurality of cells forms a honeycomb-type structure with common sidewalls of adjacent cells forming a side of the hexagonal configuration, each of said cells being defined by radiant energy absorbing and thermal energy conducting sidewalls with the cells extending along parallel axes longitudinally of the enclosure between open front and rear ends through which fluid is directed, and means to direct a fluid in heat exchange relationship with the energy absorbing structure to absorb thermal energy by receiving thermal energy by convection from the enclosure.

4,030,478

SOLAR ENERGY COLLECTORS

Emil Routzong Beaver, Jr., 4148 S. Crane Road, Tipp City, Ohio 45371

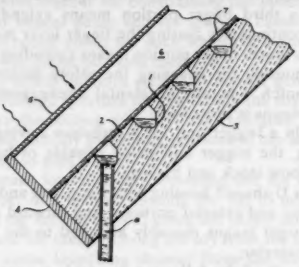
Filed Apr. 15, 1976, Ser. No. 677,493
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **4 Claims**

1. In a solar heat exchanger, the combination comprising:

a. base member of insulating material having an upper surface for frontwardly facing the sun,

b. a circuitous grooved pathway formed in said upper surface of the base member,

c. said grooved pathway having side walls disposed substantially normal to said upper surface and sloping bottom wall portions joined to the lower parts of the side walls, said bottom wall portions intersecting at substantially the central portion of the grooved pathway, whereby the rays impinging on said walls and wall portions are generally redirected into said pathway,



d. a solar energy transmitting sheet in contiguous contact with said upper surface of the base member and overlying said grooved pathway to form a closed circuitous conduit,

e. said base member having frame means extending outwardly therefrom,

f. a transparent sheet and means to secure said transparent sheet to said frame in spaced relation to said solar energy transmitting sheet to form a dead air space therebetween, and

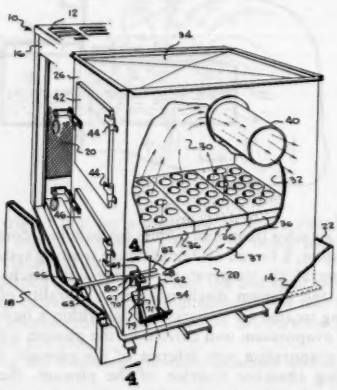
g. means to introduce a heat absorbing fluid into said closed circuitous conduit.

4,030,479

SOLID FUEL HEATER WITH BLOWBACK PREVENTION MEANS

Nolan J. Webb, Marionville, Mo., assignor to McNeil Corporation, Akron, Ohio

Filed June 23, 1976, Ser. No. 698,826
Int. Cl.² F23L *3/00*
U.S. Cl. 126—287 **12 Claims**



1. A solid fuel burning heating unit comprising a closed combustion chamber having a fuel feed door movable between an open position, combustion air inflow control means for varying the flow of combustion air into said closed com-

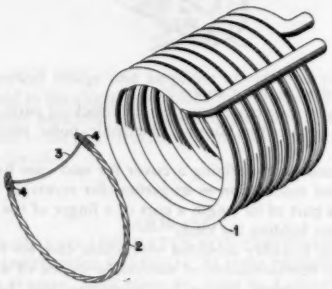
bustion chamber and an outer housing enclosing said closed combustion chamber with the outer housing having an outer housing door permitting access to the fuel feed door and camming means connected to said combustion air inflow control means for insuring that said combustion air inflow control means is positioned to permit the inflow substantial quantities of air into said combustion chamber door when said outer housing door is opened.

4,030,480

OCULAR DECOMPRESSION PROCESS

Ernst Jochen Meyer, 174 School St., Belmont, Mass. 02178

Filed May 13, 1976, Ser. No. 686,056
Int. Cl.² A61B *17/38*; A61N *1/42*; A61F *9/00*
U.S. Cl. 128—1.5 **1 Claim**



1. A method for reducing intraocular pressure, comprising the following steps in the order listed, of which those designated (a), (f), (g) and (j) are conventional, and those designated (b), (c), (d), (e), (h), (i) and (k) are wherein the improvement comprises,

a. inducing anesthesia

b. introducing a metallic wire, band, or ring, hereinafter the thermal electrode, through or immediately adjacent to the anterior chamber of the eyeball in such manner that (i) the pupil of the eye is not obstructed, and (ii) those portions of the thermal electrode not within sclera or anterior chamber are everywhere covered by fibrous or epithelial tissues,

c. introducing a second metallic band or wire, hereinafter the antenna electrode, of greater cross section than the thermal electrode, onto the surface of the surface of the sclera of the eyeball, in such manner (i) that the antenna electrode is everywhere covered by fibrous or epithelial tissues, (ii) that each of the ends of the antenna electrode overlaps one of the ends of the thermal electrode, (iii) that the antenna electrode forms more or less the arc of a circle, and (iv) that the circle described by the aforesaid arc is susceptible, by passive rotation of the eyeball, of being brought into a plane more or less parallel to the frontal plane of the face,

d. connecting each end of any thermal electrode which is not a ring with that end of the antenna electrode which overlaps it, so as to establish a closed loop electrical circuit,

e. connecting each end of any thermal electrode which is not a ring and which is not connected with an antenna electrode with the opposite end of that thermal electrode so as to form a closed loop electrical circuit,

f. closing, by means of surgical sutures, the sites at which the thermal and antenna electrodes were introduced beneath the tissues, so that these electrodes and their junctions are everywhere covered by tissue and are nowhere exposed to air,

g. infiltrating an aqueous solution under that portion of the conjunctiva which covers the thermal electrode,

h. positioning, immediately anterior to the eyeball and more or less coaxial with the circle described by the electrode(s), an insulated induction coil which is wired into and is part of a tuned radio-frequency circuit,

i. impressing upon the aforesaid induction coil, a radio-frequency voltage sufficient to induce a current in the circuit formed by the electrode(s), such that the segment of the thermal electrode which is not bathed in fluid becomes hot and by its heat creates a passage through which fluid may drain from the anterior chamber into the fibrous tissue on the surface of the eyeball,

j. controlling the onset, intensity, and duration of the radio-frequency voltage by means of electronic measuring and timing devices.

k. repeating steps (g), (h), (i), and (j) above at such intervals and for such periods of time as may be required to maintain a sufficient drainage of fluid from the eye.

4,030,481

MANOMETRIC PRESSURE SENSING AND LIQUID EVACUATING DEVICE FOR INTRAOPERATIVE HIATAL HERNIA REPAIR

Lucius D. Hill, 522 McGilvra Blvd. E., Seattle, Wash. 98102

Filed Oct. 29, 1975, Ser. No. 626,759
Int. Cl.² A61B *5/10*; A61M *25/00*
U.S. Cl. 128—2 S **5 Claims**

1. A pressure-sensing and liquid-evacuating device for measuring sphincter pressure during intraoperative hiatal hernia repair operations, comprising:

a nasal gastric suction tube for emptying liquids from the stomach and having a tip, a plurality of openings adjacent the tip for allowing passage of liquids into the tube, and an open upper end adapted to be connected to a vacuum source, and

a smaller, soft, flexible pressure-sensing tube secured to said nasal gastric suction tube and having an uncovered, pressure-sensing single opening located externally of the nasal gastric suction tube and a short distance from the tip of said nasal gastric suction tube, with the pressure sensing opening adapted to be exposed directly to the interior of the stomach or esophagus, and engagable by the sphincter muscle whereby the pressure of the stomach, sphincter muscle and esophagus can be sensed immediately following the repair while simultaneously removing liquid from the stomach.

3. A pressure-sensing and liquid-evacuating device for measuring sphincter pressure during intraoperative hiatal hernia repair operations, comprising:

a nasal gastric suction tube for emptying liquids from the stomach and having a tip, a plurality of openings adjacent the tip for allowing passage of liquids into the tube, and an open upper end adapted to be connected to a vacumm source, and

a smaller, soft, flexible pressure-sensing tube secured to said nasal gastric suction tube and having a pessure-sensing opening located a short distance from the tip of said nasal gastric suction tube whereby the pressure of the stomach, sphincter muscle and esophagus can be sensed immedi-

ately following the repair while simultaneously removing liquid from the stomach,

said pressure-sensing opening being located a known distance up from the tip of the suction tube so that the location of the pressure-sensing opening in the gastroesophageal junction can be accurately determined by sensing the location of the tip of the nasal gastric suction tube.

4,030,482

CONTACT FEVER THERMOMETER

José Miguel Antonio Rosario Navato, Manchester, Mo., assignor to Lake St. Louis Research Products, Inc., Lake St. Louis, Mo.

Filed Nov. 20, 1975, Ser. No. 633,813
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2 H **11 Claims**

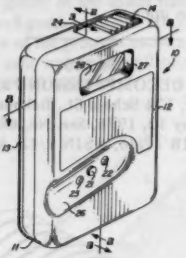
1. A contact fever thermometer adapted to be applied to the skin of the human body to visually indicate the temperature of the tissue immediately beneath the thermometer comprising a substantially rigid metal substrate, adhesive applied to one face of the substrate for adhering the substrate to the skin, said substrate being a substantially flat member having a length and a width of ½ inch or less so that when it is adhered to the skin the skin conforms generally to the shape of the substrate thereby to insure good thermal contact between the skin and the substrate so that the substrate substantially assumes the average temperature of the tissue to which it is adhered, a dark background on the other face of the substrate, and a plurality of numerical display areas on said dark background, each of said numerical display areas being comprised of a layer of liquid crystals which change color in response to changes in temperature within a specified temperature range with the liquid crystals in each of said numerical display areas being adapted to change color in response to changes in temperature within a different temperature range than do the liquid crystals in the other display areas whereby when said thermometer is applied to the skin, one of said numerical display areas displays a most clearly visible numerical temperature thereby indicating the average temperature of the tissue beneath the substrate, each of said layers of liquid crystals forming said numerical display areas being initially of a color substantially the same as said background at temperatures below a minimum threshold temperature and above a maximum threshold temperature, the span of temperatures between said minimum and maximum threshold temperatures constituting said range of temperatures, two of said display areas being in superimposed relation with one another on said substrate with the maximum threshold temperature of one of said superimposed numerical display areas being below the minimum threshold temperature of the other of said superimposed numerical display areas whereby only one of the superimposed numerical display areas is visible at one time.

4,030,483

PULSE RATE MONITORING DEVICE

Jack D. Stevens, 1229 S. Barkley, Mesa, Ariz. 85204

Filed Apr. 26, 1976, Ser. No. 680,136
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 T **5 Claims**



1. A cardiac monitor comprising:

a hand-held case comprising two interlocking parts defining an enclosure for housing electronic pulse sensing circuitry,

one of said parts defining a cover for said case having an exposed indentation in its surface for receiving along at least a part of its length a part of a finger of the hand of the user holding the case,

electronic circuitry mounted within said case for receiving signals representative of successive pulses of a cardiac wave, counting means for recording said successive pulses sensed, and digital readout means for indicating periodic summations of said counting means, and

dual purpose means mounted within said indentation and connected to said electronic circuitry for energization of said circuitry and sensing of said successive pulses upon positioning of the finger of the user in said indentation,

said dual purpose means comprising a switch for electronically energizing said electronic circuitry upon positioning of the finger of a user in said indentation, an electric light bulb energized by said electronic circuitry and illuminating the finger in said indentation, and a sensor connected to said electronic circuitry for sensing the changing illuminated condition of the finger during successive pulses of the cardiac wave,

said switch electric light bulb and sensor being spacedly arranged within and along the length of said indentation, and

said indentation comprising an open trough form-fitting the thumb of a user.

4,030,484

NON-INVASIVE BLOOD PRESSURE MONITOR

Walter J. Kuska, Harwood Heights, and Edward J. McGowan, Jr., Villa Park, both of Ill., assignors to Stoelting Company, Chicago, Ill.

Continuation-in-part of Ser. No. 523,567, Nov. 14, 1974, abandoned. This application Sept. 1, 1976, Ser. No. 719,425
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 R **7 Claims**

1. A monitor of subcutaneous blood pressure comprising:

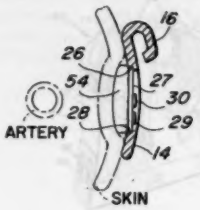
a. a body having a contact face for bearing against the skin of a subject, a back face and an opening in said body extending from said contact face to said back face;

b. a diaphragm operatively mounted in said opening for deflection of the same in a direction perpendicular thereto having a contact face in continous and substantially flush relation generating a strain output therein from a subcutaneous with the contact face of said body and having means for securing the edge of said diaphragm thereto with substantially a rigidly-mounted edge-fixity;

c. a means for operationally holding the contact faces of the

body and the diaphragm therein at a determinable contact bearing pressure against the skin of the subject;

d. an electrical strain-sensor opertively connected to an input source of electrical power mounted on the back face of said diaphragm having an electrical output in direct relation to the strain input from the deflection of the diaphragm under subcutaneous blood pressure;



e. electrical bridge and amplifier circuit operatively-connected to the electrical output from the strain-sensor; and

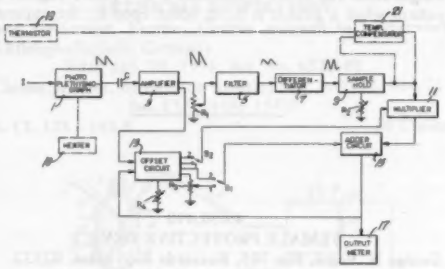
f. pressure indicating and recording means operatively-connected to the electrical output from the bridge and amplifier circuit.

4,030,485

METHOD AND APPARATUS FOR CONTINUOUSLY MONITORING SYSTOLIC BLOOD PRESSURE

Glenfield Warner, 3010 Matis St., Ville St. Laurent, Quebec, Canada H4R 1A3

Filed Nov. 12, 1974, Ser. No. 523,196
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 A **18 Claims**



1. A method for continuously monitoring systolic pressure in a human or animal subject by means of a calibrated instrument including light transducer means for converting variations in light intensity to variations in amplitude of an electrical quantity comprising:

detecting, with said transducer means, variations in light intensity corresponding to variations in blood volume of the tissue of said subject under said transducer means;

whereby the output of said tranducer means comprises variations in amplitude of said electrical quantity corresponding to said variations in blood volume;

differentiating said variations in amplitude of said electrical quantity with respect to time to provide a differentiated amplitude representative of the rate of said variations in blood volume;

periodically selecting a sample of said differentiated amplitude; and

adding to said sample an amplitude of a like electrical quantity representative of a reference pressure;

to thereby produce an electrical signal whose amplitude is proportional to systolic pressure of said subject ; and

providing said electrical signal to a display means to drive said display means whereby the magnitude of said systolic pressure is displayed on said display means.

15. A calibrated instrument for continuously monitoring the systolic pressure of a human or animal subject comprising;

transducer means for detecting variations in light intensity corresponding to variations in blood volume of the tissue of said subject under said transducer means;

means for converting said variations in light intensity to variations in amplitude of an electrical quantity;

differentiating means for differentiating said variations in amplitude of said electrical quantity with respect to time to provide a differentiated amplitude representative of the rate of said variations in blood volume;

sampling means for periodically selecting a sample of said differentiated amplitude;

means for providing an amplitude of a like electrical quantity representative of a reference pressure;

adding means to add said sample and said amplitude representative of reference pressure;

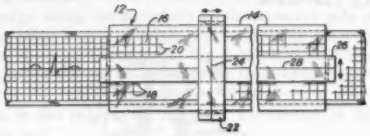
whereby to produce an electrical signal whose amplitude is proportional to the systolic pressure of said subject; display means for receiving said electrical signal and displaying the magnitude of the systolic pressure.

4,030,486

APPARATUS FOR MEASURING DEFLECTION AND TEMPORAL VALUES ON ELECTROCARDIAC TRACINGS

George Eastman, 102 Old Clairton Road, Pittsburgh, Pa.

Division of Ser. No. 831,954, June 10, 1969, Pat. No. 3,884,221. This application May 15, 1975, Ser. No. 577,873
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.06 R **3 Claims**



1. Apparatus for measuring voltage deflection values and temporal values on electrocardiographic tracings comprising,

transparent reading means having a grid integral therewith constructed and arranged to divide the tracing into discrete units of voltages and time,

first cursor means slidably engaging two opposing sides of said reading means and detachable therefrom and constructed and arranged to delineate a discrete time value on the tracing, and

second cursor means slidably engaging two other opposing sides of said reading means and detachable therefrom and constructed and arranged to delineate a discrete voltage value on the tracing.

4,030,487

FOLDABLE VIBRATION MASSAGE DEVICE

Dennis B. McEachran, Spokane, Wash., assignor to Quadrelax Corporation, Spokane, Wash.

Filed Apr. 21, 1976, Ser. No. 678,875
Int. Cl.² A61H 29/00
U.S. Cl. 128—24.1 **12 Claims**

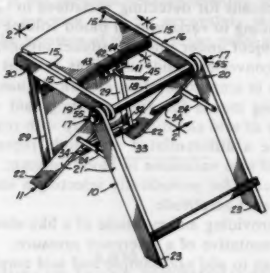
1. A vibration massage device, comprising:

an A-frame comprised of two spaced pairs of upright leg members pivoted at upper ends thereof for movement about a horizontal axis between (a) a storage condition wherein the four legs are in alignment along the horizontal axis with edges thereof being coplanar; and (b) an expanded condition wherein the legs of each pair form an inclusive acute angle about the horizontal axis;

a cushioned pad;

means for removably mounting the pad to the A-frame;

spring means for suspending the cushioned pad on the mounting means and for isolating vibrations of the cushioned pad from the A-frame and mounting means;



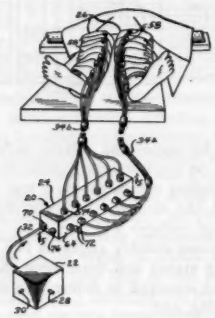
a vibrating unit on the pad for vibrating the cushioned pad to massage an area of a user's body in contact with the pad.

4,030,488

INTERMITTENT COMPRESSION DEVICE

James H. Hasty, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Oct. 28, 1975, Ser. No. 626,018
Int. Cl.² A61H *1/00*
U.S. Cl. 128—24 R **21 Claims**



1. A device for applying compressive pressures against a patient's limb from a source of pressurized fluid, comprising:

an elongated pressure sleeve for enclosing a length of the patient's limb, said sleeve having a plurality of separate closed fluid pressure chambers progressively arranged longitudinally along the sleeve from a lower portion of the limb to an upper portion of the limb proximal the patient's heart relative said lower portion;

means for intermittently forming a pressure pulse from said source during periodic compression cycles;

means for separately connecting said pulse to said chambers at the start of the compression cycles;

means for developing progressively diminishing rates of pressure increases in progressively located upper chambers during the compression cycles to apply a compressive pressure gradient against the patient's limb by the sleeve which progressively decreases from said lower to upper limb portions; and

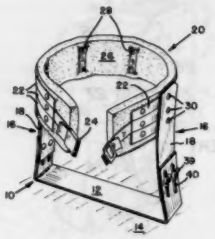
means for intermittently connecting said chambers to an exhaust means during periodic decompression cycles between said compression cycles.

4,030,489

TRACTION APPARATUS

William L. Buckner, Rte. 2, Sanford, N.C. 27330

Filed Sept. 17, 1975, Ser. No. 614,133
Int. Cl.² A61H *1/02*
U.S. Cl. 128—75 **10 Claims**



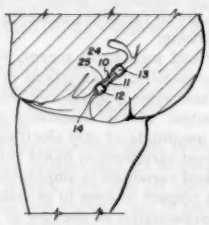
1. A portable lumbo-sacral traction apparatus comprising: a free-standing integrally formed U-shaped supporting frame; a suspension belt adapted to be worn around the lower thoracic region of a patient rigidly and releasably secured to such frame, said belt including at least one pre-shaped encircling member adapted to extend substantially completely around the lower thoracic region of a patient, means for releasably securing said encircling member about the lower thoracic region of a patient, a cushioning pad contiguous with said encircling member and adapted to at least partially encircle the lower thoracic region of a patient with said encircling member, and means joining said encircling member to said cushioning pad; and means releasably securing said suspension belt to said U-shaped frame whereby the U-shaped frame applies upward tension to the suspension belt to remove weight from the lower lumbo-sacral and pelvic regions of a patient when a patient is being acted upon by the apparatus.

4,030,490

FEMALE PROTECTIVE DEVICE

George N. Vogel, Box 705, Buzzards Bay, Mass. 02532

Filed Nov. 14, 1975, Ser. No. 631,811
Int. Cl.² A61F *5/46*
U.S. Cl. 128—130 **4 Claims**



1. A female protection device comprising,

a. an elongated slender shaft having a first sharp end and a second end,

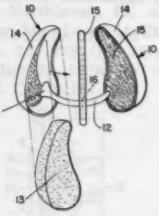
b. a first enlargement concentrically fixed to the shaft adjacent to but spaced from the sharp end of the shaft, and

c. a second enlargement fixed to the second end of the shaft.

4,030,491
NASAL FILTER

Alvin Mattila, 2 Beaver St., San Francisco, Calif. 94114

Filed Oct. 31, 1975, Ser. No. 627,517
Int. Cl.² A61M *15/08*
U.S. Cl. 128—140 N 5 Claims

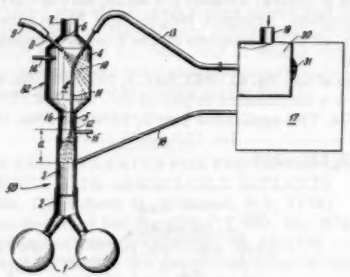


1. A nasal filter device adapted to be inserted into the nostrils of the nose, comprising a pair of walled containers each having an open side and an opposite perforated side, each open side facing toward the other open side, flexible bridge means having distal end portions extending through said respective open sides and disposed in respective said containers and fixed thereto, a pair of perforated covers complementally configured to span respective open sides of said containers, each said cover having an aperture, said flexible bridge means extending through said apertures, said covers operative to move towards each other on said bridge means, and porous filter means removably disposed in said containers, said containers having substantially the shape of said nostrils.

4,030,492
DEVICE FOR SUPPORTING HUMAN BREATHING AND ARTIFICIAL RESPIRATION

Georg Simbruner, Vienna, Austria, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed Jan. 28, 1976, Ser. No. 653,148
Claims priority, application Austria, Feb. 5, 1975, 866/75
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 10 Claims



1. A device for supplying human breathing and artificial respiration, comprising a tracheal tube having one first tubular end connectible to the person's trachea, an opposite second tubular end connectible to atmosphere and an intermediate tubular portion connected between said one tubular end and said opposite tubular end and defining an interior pressure chamber therein, said one tubular end, said pressure chamber and said opposite tubular end defining a continually opened flow passage therethrough, at least one first breathing gas conduit connected into said pressure chamber and discharging breathing gas across said flow passage to provide a constant pressure in said tracheal tube, and at least one second breathing gas conduit connected into said pressure chamber and having a discharge extending substantially axially toward said first tubular end with respect to said flow passage, and control means connected to said second breathing gas conduit for controlling the gas supply thereto in accordance with the respiration rhythm.

4,030,493
RESPIRATORY MOUTHPIECE

William T. Walters, and Marvin D. Parlette, Jr., both of Toledo, Ohio, assignors to Conceptual Products, Inc., Toledo, Ohio

Filed June 18, 1976, Ser. No. 697,410
Int. Cl.² A61M *16/00*
U.S. Cl. 128—147 5 Claims

1. A flexible, resilient respiratory mouthpiece for a therapeutic breathing apparatus comprising

a. a substantially ovate, concave face plate,

b. a ridge along the periphery of the concave side of said face plate having a height above the face plate greater than the wall thickness of the face plate in the regions across the shorter diameter of the face plate, and a height above the face plate no greater than the said wall thickness in the regions of the ovate extremities of the face plate and

c. a tube defining an elongated opening in the center of the face plate and extending inwardly on the concave side of the face plate, adapted to fit over a mouthpiece holder of a breathing apparatus;

d. the mouthpiece being a one piece integral molding of an elastomeric material having sufficient stiffness and flexibility to provide a seal against air pressure entering the mouth from the breathing apparatus when the ridge is pressed inwardly against the outer surfaces around a patient's mouth.

4,030,494
FLUID CONNECTORS

Francis Tenczar, 8931 S. Bell, Chicago, Ill. 60620

Division of Ser. No. 412,553, Nov. 5, 1973. This application Nov. 15, 1976, Ser. No. 741,630
Int. Cl.² A61M *5/00*; F16L *47/00*
U.S. Cl. 128—214 R 6 Claims

1. A connector assembly to prevent entry of contaminants, including

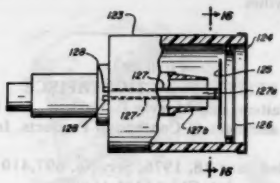
a pair of terminal connectors, each terminal connector having a housing, a conduit extending from one end of each housing and communicating with the interior of the housing, an openable end of each housing closed by a heat penetratable and fusible plastic barrier,

coupling means within each housing communicating with the conduit,

a penetrator element associated with one of the coupling means, and

a conductive heating element positioned at least adjacent one barrier, and conductor means joining said heating

element and said coupling means, whereby said plastic barriers may be adjoined and a power source may energize the element to penetrate the adjoined plastic barrier



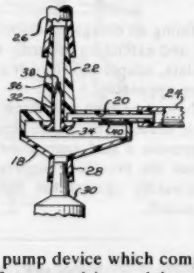
and, at the same time, fuse and sterilize the penetrated portions, whereby relative movement between adjoined plastic barriers and the penetrator element allows the coupling means to be joined.

4,030,495

TWIN CHECK VALVE PUMP SYSTEM HAVING FAIL-SAFE CHARACTERISTIC

Robert Anthony Virag, Lake Zurich, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 7, 1975, Ser. No. 629,835
Int. Cl.² A61M 5/18
U.S. Cl. 128—214.2 **9 Claims**



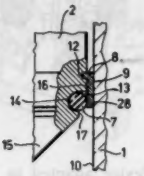
1. A multiple valve pump device which comprises a pumping chamber adapted for pressurizing and depressurizing fluid in said chamber, a first, one-way inlet valve communicating with said pumping chamber and adapted to permit fluid flow therein, a second, one-way outlet valve communicating with the pumping chamber and adapted to permit fluid flow out of said chamber, and an upstream inlet flow path for providing fluid to the pumping chamber through the inlet valve, said second outlet valve being biased to prevent outflow of fluid below a predetermined pressure, the improvement comprising, in combination, a porous member in communication with the interior of said pumping chamber on one side of said member and in communication with said inlet flow path on its other side, to permit selective fluid communication between said pumping chamber and inlet flow path through said porous member without passing through said first valve, said porous member being capable of allowing passage of a first fluid material, while preventing the passage of a second fluid material, whereby said second fluid can be pumped, but said pump device is prevented from pumping in the presence of substantial quantities of said first material.

4,030,496

SYRINGE FOR INJECTING LIQUIDS INTO BLOOD VESSELS OF LIVING BODIES

Donald Peter Stait, Steinmaur, and Willi Zenger, Zurich, both of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed July 12, 1976, Ser. No. 703,898
Claims priority, application Switzerland, July 28, 1975, 9799/75
Int. Cl.² A61M 5/00
U.S. Cl. 128—215 **5 Claims**



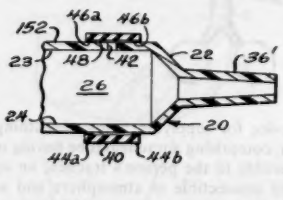
1. A syringe for injecting liquids into blood vessels of living bodies, comprising a cylinder having opposed ends, one end of the cylinder being provided with a flange and the other end of the cylinder being provided with a catheter connection, a piston arranged for two-and-fro movement in the cylinder, said piston having a groove, a sealing ring arranged in said groove, said piston having a channel which is substantially parallel to said groove, a substantially L-shaped slide ring arranged between the sealing ring and an inner wall of the cylinder, said L-shaped slide ring having a first leg and a second leg, the first leg sealing bearing against the inner wall of the cylinder, said second leg being inserted in said channel to operatively connect the slide ring with piston, said piston including an inclined portion extending to a tip of the piston, said piston having a substantially cylindrical shoulder extending from said groove to the start of the inclined portion of the piston tip, said cylindrical shoulder extending at least to the region of the center of the deformed sealing ring.

4,030,497

SYRINGE ASSEMBLY

William J. Binard; Anthony J. Ciarico, both of Cary; Leonard R. Anglada, Arlington Heights, and Bhupendra C. Patel, Elgin, all of Ill., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 627,982, Nov. 3, 1975, Pat. No. 4,000,741, which is a continuation-in-part of Ser. No. 509,757, Sept. 27, 1974. This application July 2, 1976, Ser. No. 702,164
Int. Cl.² A61M 5/00
U.S. Cl. 128—215 **3 Claims**



1. A syringe, comprising:
a barrel having a chamber for retaining fluid, and opening means communicating between the chamber and the outside of the barrel;
a tip for attachment to a fluid receiving device;
a plunger having one end received in the chamber for pumping fluid from the chamber; and
a flexible balloon secured to the barrel over said opening means and defining a cavity communicating with fluid in

the chamber through the opening means, said balloon inflating above a predetermined pressure to relieve pressure generated by the syringe.

4,030,498

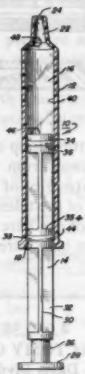
SYRINGE

Douglas L. Tompkins, Northbrook, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 517,998, Oct. 25, 1974, abandoned. This application July 22, 1976, Ser. No. 707,684

Int. Cl.² A61M *5/00*

U.S. Cl. 128—218 P **7 Claims**



1. In a syringe comprising a barrel defining a bore and having a discharge portion, and a plunger extending into said bore and movable therewithin, the improvement comprising, in combination: inner sealing means carried by said plunger and movable axialy within said bore in an area proximate to said discharge portion for substantially preventing leakage of medicament or other biologic fluid contained in the space forward of said inner sealing means adjacent said discharge portion; outer sealing means carried by said plunger, said outer sealing means being spaced axially from said inner sealing means and movable axially within said bore in an area behind the travel area of said inner sealing means; said plunger having an axial length within the bore of more than one-half of the functional length of the bore void of sealing rings; and means for preventing said outer sealing means from moving in the area in which said inner sealing means travels.

4,030,499

METHOD AND APPARATUS FOR PROVIDING LIVING BEINGS WITH ABSORBABLE IMPLANTS

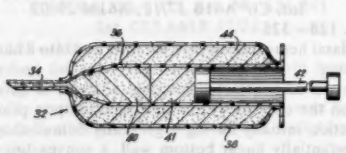
Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Continuation-in-part of Ser. No. 537,572, Dec. 30, 1974. This application June 7, 1976, Ser. No. 693,134

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.² A61M *1/00, 31/00*

U.S. Cl. 128—260 **7 Claims**



1. Method of treating a living being, with a solid composition which affects the health or appearance of said living being, which comprises implanting in a molten injectable condition in the internal tissue of the living being, sufficiently close to the outer skin of the living being to be influenced by an elevation of temperature of the outer skin, a depot of at least one composition which is safely absorbable by the living being and which solidifies at the temperature of the body of the living being while being molten and injectable at a higher temperature at which it is implanted, the implanting temperature not adversely affecting the living being during the implanting, and said solid composition responding to an increase in temperature at the outer skin of the living being adjacent the location of the solid composition to assume a condition according to which said solid composition is absorbed more rapidly by the body of the living being than if the temperature at the outer skin adjacent the solid composition is not elevated, and thereafter whenever it is desired to increase the rapidity with which the solid composition is absorbed by the body applying heat to the outer skin adjacent the solid composition for reducing the time that the latter remains unabsorbed by the body.

4,030,500

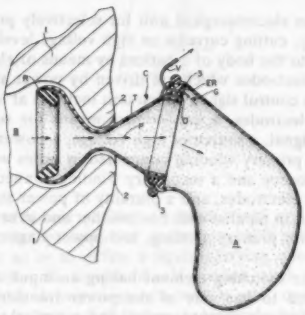
FECAL MATTER COLLECTOR

Hadar Yngve Ronnquist, 95082 Nikkala, Sweden

Continuation of Ser. No. 518,952, Dec. 16, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 638,033

Int. Cl.² A61F *5/44*

U.S. Cl. 128—283 **1 Claim**



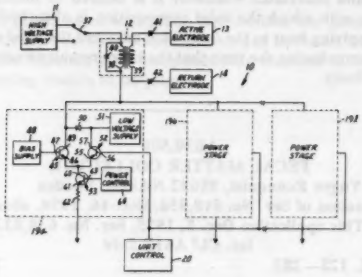
1. A fecal matter collector including a continuous closed tubular member of flexible and resilient material having a first end operatively associated with a user's rectum, said first end being inserted within the rectum, said member having an intermediate length of restricted cross section placed at and extending through the anal opening of a user at the place of the sphincter muscle of the user, a second end of said member external of the rectum, said ends being of substantially greater dimensions than that of said restricted intermediate length and being open, a solid ring of resilient material operatively connected with each said open end of the tubular member and conjointly therewith forming the overall continuous closed tubular member, said ring at the internal end of said member being attached in the interior of the tube at the open end, and having a flattened conical configuration for association with the interior of the rectum proximate the anal opening and anal sphincter thereof, and adapted for maintaining the tube in operative association within the rectum of a user, a collector bag of substantially uniform resilient and continuous material, said bag having an open end and being removably connected to said second external end of said tubular member, the external ring being integrated with the exterior of the tube material proximate the second open end and having an external groove therein, said collector bag having the open end thereof positioned externally of said ring, and a resilient material solid ring disposed externally of the end of the bag, and associating this end in the groove of the ring and resiliently interconnecting the collector bag with the tubular member and adapting the

bag for easy removal for cleaning and/or replacement, and at the external ring a gas and air vent opening to permit escape of gaseous material from the collecting bag to the exterior.

4,030,501
HIGH FREQUENCY-HIGH VOLTAGE LEVEL ELECTROSURGICAL UNIT

G. Kent Archibald, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 26, 1976, Ser. No. 652,144
Int. Cl.² A61B 17/36; A61N 3/02
U.S. Cl. 128—303.14 6 Claims



1. In an electrosurgical unit for selectively providing high frequency, cutting currents or high voltage level coagulation currents to the body of a patient by means of electrosurgical patient electrodes which are driven by power stages actuatable by a control signal, which unit includes at least a pair of patient electrodes, a unit control means for supplying said control signal, a source of high voltage, a power transformer having a primary winding connected in series with said high voltage source and a secondary winding connected in series with said electrodes, and a plurality of power stages that are connected in parallel with one another and in series with said transformer primary winding, said power stages each including:

a power switching element having an input terminal connected to one side of the power transformer primary winding, an output terminal and a control terminal;

a constant current means connected in series with the output terminal of said switching element;

a power control means for variably adjusting the amount of current flowing through said current means;

a bias supply means connected to the control terminal of said switching element for supplying a bias voltage thereto;

a voltage source clamping means connected to the input terminal of said switching element to supply a sufficient level of voltages to said input terminal that said switching element is prevented from operating in a saturated state in order that each of the entire power stages has a constant current flowing therethrough; and

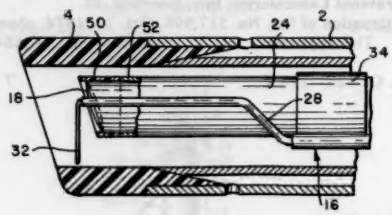
a signal source means that is driven by said control signal and is connected to the output terminal of said switching element to control the actuation thereof and supply current to said current means whenever current flow through said switching element is interrupted.

4,030,502
ANTI-ARCING RESECTOSCOPE

Jose Juan Iglesias, 1341 North Avenue, Elizabeth, N.J. 07200

Filed Dec. 5, 1975, Ser. No. 638,061
Int. Cl.² A61B 17/32
U.S. Cl. 128—303.15 4 Claims

1. A resectoscope comprising a sheath having a beaked distal end, a telescope within and extending longitudinally of the sheath and having a distal end having a lens adjacent the beaked distal end of the sheath, a tube extending longitudinally of the sheath and the telescope and engaging and at least partially surrounding the telescope to support and stablize it, the tube having a distal end adjacent the distal end of the telescope, a cutting loop assembly adjacent and extending longitudinally of the telescope and having a depending bare wire loop which is positioned distal to the distal end of the telescope and is adapted to be charged with electricity, means



for reciprocating the cutting loop assembly to move the bare wire loop toward and away from the distal end of the telescope, the distal end extremity of the tube being positioned distally of the distal end of the telescope and proximally of the most proximal position of the bare wire loop to prevent electrical arcing between the bare wire loop and the distal end of the telescope.

4,030,503
EMBOLECTOMY CATHETER

William T. Clark, III, 6 Davis Blvd., New Orleans, La. 70121

Filed Nov. 5, 1975, Ser. No. 628,982
Int. Cl.² A61B 17/22
U.S. Cl. 128—304 8 Claims

1. A thrombolectomy catheter comprising

a flexible shaft having forward and rear ends,

a handle on the rear end of the shaft,

a wire having a forward extremity extending beyond the forward end of the flexible shaft,

a rounded blunt member on the forward extremity of the wire, and

a spiral helix surrounding the forwardly-projecting portion of the wire and extending rearwardly from the rounded blunt member the forward portion of said helix having a rounded forwardly-disposed surface, and said helix having a sharp rearwardly-disposed outer edge portion.

4,030,504
NASAL HEMOSTAT AND METHOD OF CONSTRUCTION OF NASAL HEMOSTAT

Donald E. Doyle, 8147 Armor Road, Los Angeles, Calif. 90046

Filed Aug. 15, 1975, Ser. No. 605,148
Int. Cl.² A61B 17/12; A61M 29/02
U.S. Cl. 128—325 9 Claims

1. A nasal hemostat adapted for insertion into a nasal cavity, comprising:

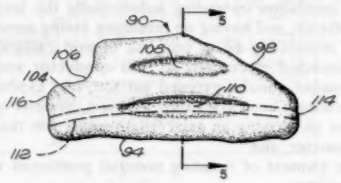
a tampon of contracted material adapted to be expanded upon the contact with a fluid, said tampon prior to contraction initially having a generally domed-shape with a substantially linear bottom wall, a convex top wall, two parallel side walls, and a substantially rectangular tongue continuous with said bottom wall protruding from the posterior end of said tampon, a first side wall having an upper and lower elongated recess formed longitudinally therein to respectively receive the middle and inferior

conchae of the lateral wall of the nasal cavity when the tampon is operatively positioned, said tongue terminating near the pharynegal orifice of the auditory tube when the tampon is operatively positioned, said contracted tampon being adapted to apply hemostatic pressure to substantially all parts of the nasal cavity when expanded in operative position including the inferior, middle and superior meatus, the inferior, middle and superior conchae, and the sphenoethmoidal recess; and

an elongated breathing tube extending longitudinally through said contracted tampon between the anterior and the posterior ends, said tube extending through said tongue to allow nasal breathing when the tampon is expanded in operative position within the nasal cavity.

9. A method of constructing a nasal hemostat from a material which is expansible upon contact with fluids to form a tampon adapted to apply pressure against substantially all of the walls of a nasal cavity when expanded in operative position, comprising the steps of:

forming said tampon with a substantially linear bottom wall, a convex top wall, two substantially parallel side walls,



and a substantially rectangular tongue continuous with the bottom wall and protruding from the posterior end of said tampon, said top and bottom walls being relatively narrow;

forming at least an upper and a lower elongated recess longitudinally in a first one of said side walls, said recesses being adapted to respectively receive the middle and inferior conchae of the lateral wall of the nasal cavity when the tampon is expanded in operative position;

positioning an elongated hollow breathing tube within said formed tampon, said tube extending through the tampon from the anterior end through said tongue to allow nasal breathing when the tampon is expanded in operative position;

wetting the formed tampon with a fluid;

compressing the wetted tampon into a contracted state by centripetal forces directed substantially towards the breathing tube so that no portion of said tampon is folded over any other portion of the tampon; and,

allowing the compressed tampon to dry in said contracted state.

4,030,505

METHOD AND DEVICE FOR DISINTEGRATING STONES IN HUMAN DUCTS

Arthur N. Tessler, New York, N.Y., assignor to Calculus Instruments Ltd., New York, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,241
Int. Cl.[2] A61B *17/22*
U.S. Cl. 128—328 **10 Claims**

1. Method for removing concretions within human ducts comprising:

A. axially abutting a concretion within a human duct, while outwardly distending the walls of said duct adjacent said concretion;

B. generating a series of high voltage electrical pulses of sufficiently low amperage to avoid harm to human tissues;

C. directing said pulses within an insulating medium extending into said duct to the situs of said concretion

D. selectively discharging said pulses radially outwardly across the surface of said concreation; and

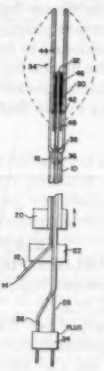
E. flowing a liquid peripherally of said discharging of pulses, so as to direct an hydroelectric impact against said concretion.

6. A device for removing concretions within human ducts comprising:

A. A a flexible conduit of inert material of a size to be extensible within said ducts to the situs of said concretions and having an inlet and an outlet and including:

i. a flexible positive electrode extending coaxially within and terminating at said outlet of said conduit and being embedded in electrically insulative material; and

ii. a negativve electrode peripherally embedded in said conduit apart from said positive electrode and terminating at said outlet of said conduit, as a continuous electrically conductive surface encircling and coextensive with said positive electrode, said negative electrode being supported apart from said positive electrode so as to define a liquid carrying outer annulus extending the length of said conduit, such that liquid may be delivered simultaneously and coextensively with an electrical discharge, as hydroelectric cavitation upon said concretions and as insulating medium intermediate said electrodes,



B. a harp distender supported at said outlet of said flexible conduit and extending beyond said electrodes, means for moving said sharp distender so as to distend outwardly said ducts in the area of said electrodes; and

C. a high voltage, low amperage pulse generating apparatus operatively connected to said positive electrode and said negative electrode, such that electrical discharges radiate from said positive electrode across the surface of said concretions.

4,030,506

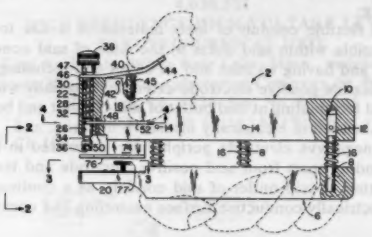
EARLOBE PIERCING DEVICE

David McDonald, Mill Valley, Calif., assignor to Golden M Enterprises, Inc., Mill Valley, Calif.

Filed Dec. 15, 1975, Ser. No. 641,197
Int. Cl.[2] A61B *17/00;* **B25C** *5/06*
U.S. Cl. 128—330 **15 Claims**

1. In an earlobe piercing device having first and second jaws mounted for relative movement towards and away from each other for positioning a jaw on each side of an earlobe positioned therebetween, a plunger slidably mounted on the first jaw and including means for engaging an earlobe piercing stud, and means for forcing the plunger in an axial direction towards the second jaw so that an earlobe when placed between the jaws can be pierced with a free end of the stud

engaged by the plunger, the improvement comprising: jaws defined by substantially parallel bars having a sufficient length to be hand-held and operated by a user, the plunger being positioned adjacent one end of the bars, first means adjacent the one end and positioned to be operated by fingers of the



same hand holding the device for releasing the piston forcing means, and second means positioned adjacent the one end of the bars and also positioned to be operated by a finger of the same hand holding the device for retracting and thereby energizing the plunger forcing means in preparation for a subsequent release thereby by the first means.

4,030,507

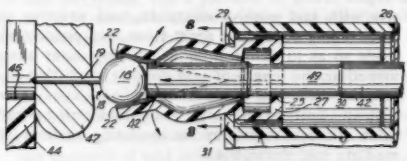
STERILE EARLOBE-PIERCING ASSEMBLY

Samuel Mann, Englewood, N.J., assignor to Inverness Corporation, Englewood, N.J.

Continuation-in-part of Ser. No. 543,380, Jan. 23, 1975, abandoned. This application Dec. 15, 1975, Ser. No. 641,045

Int. Cl.² A61B *17/00*

U.S. Cl. 128—330 **22 Claims**



1. An earlobe piercing assembly comprising in combination a piercing earring including an enlarged portion and a piercing pin extending therefrom, a cartridge configured to receive said piercing earring and substantially envelop said earring, said cartridge including an elongated opening partially supporting said piercing pin, and a further opening proximate said enlarged portion of said earring, and in longitudinal alignment with said elongated opening, said elongated opening having a smaller lateral dimension that said further opening and said enlarged portion of said earring, plunger means adapted to be longitudinally displaced, said plunger means including earlobe support means, said displacement of said plunger means effecting an entry of said plunger means through said further opening of said earring cartridge into contact with said enlarged portion of said earring and a forcing of the enlarged portion of the piercing earring into said elongated opening to thereby forcibly expand said elongated opening along the lengthwise extent thereof and further force said enlarged portion of said piercing earring out of the cartridge through and guided by the first elongated opening, and housing means for receiving said cartridge and positioning said cartridge openings in alignment with said plunger means and preventing displacement of said cartridge when said plunger means is displaced through aid earring cartridge to effect a forcing of said earring from said cartridge.

4,030,508

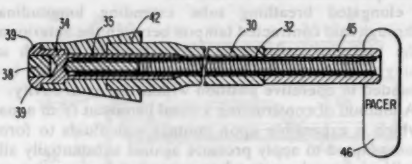
LOW OUTPUT ELECTRODE FOR CARDIAC PACING

Hilbert J. Th. Thalen, Duinkampen, Netherlands, assignor to Vitatron Medical B.V., Dieren, Netherlands

Filed Feb. 4, 1976, Ser. No. 655,156

Int. Cl.² A61N *1/04, 1/36*

U.S. Cl. 128—418 **8 Claims**



1. A catheter for use in a cardiac pacing system, the catheter serving to deliver stimulus pulses from a pacer to a patient's heart, said catheter comprising:

a. a conductor extending substantially the length of the catheter, and having an insulating casing around it;

b. a stimulating tip at one end of said catheter, said tip connected electrically to said conductor and having a rounded annular exposed surface, said exposed surface defining a central opening having a diameter of at least 1 mm and having an axial length much less than its outer diameter; and

c. an element of isolating material positioned within said opening.

4,030,509

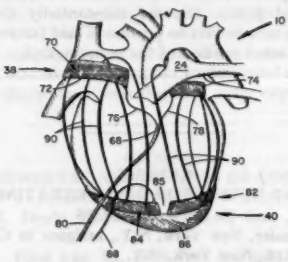
IMPLANTABLE ELECTRODES FOR ACCOMPLISHING VENTRICULAR DEFIBRILLATION AND PACING AND METHOD OF ELECTRODE IMPLANTATION AND UTILIZATION

Marlin S. Heilman, Gibsonia; Alois A. Langer, Pittsburgh, both of Pa.; Mieczyslaw Mirowski, Owings Mills; Morton M. Mower, Baltimore, both of Md., and David M. Reilly, Pittsburgh, Pa., assignors to Mieczyslaw Mirowski, Owings Mills, Md.

Filed Sept. 30, 1975, Ser. No. 620,026

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 D **31 Claims**



1. The combination of an implantable cardioverting electrode and pacing electrode, the combination comprising: conductive base electrode means for associating with the base of the heart; conductive apex electrode means of substantially frustoconical shape throughout at least a portion thereof, for lying adjacent but exterior to the apex of the heart and conforming to the contours thereof; and an auxiliary electrode insulated from both said base and said apex electrodes and extending from the surface of one of said base or said apex electrodes in the direction of the heart, said auxiliary electrode serving to deliver pacing energy to the heart.

4,030,510

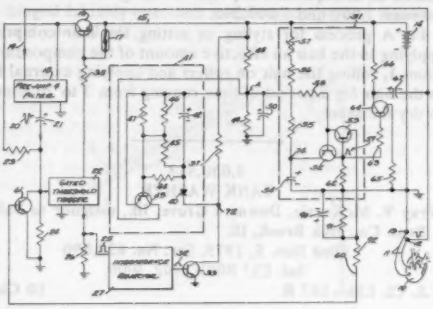
STANDBY HEART PACER

David L. Bowers, West Allis, Wis., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 18,051, March 10, 1970, abandoned. This application Nov. 5, 1975, Ser. No. 628,956

Int. Cl.[2] A61N 1/36

U.S. Cl. 128—419 PG 9 Claims



1. A standby heart pacer comprising:

a. a selected-rate pace pulse generator having output terminals adapted to be connected to the heart and to stimulate with pace pulses the heart at regular time intervals in the absence of natural heart action,

b. power source terminals,

c. a timing network included in said pace pulse generator and adapted to set the time period between pace pulses, said timing network being connected with a power source terminal,

d. detector means directly connected to at least one output terminal and responsive to heart activity signals to produce corresponding detector output signals,

e. means responsive to said pace pulse generator pace pulses to produce a detector output signal inhibiting signal on occurrences of a pace pulse,

f. a hysteresis means interposed between said detector means and said pace pulse generator timing network said hysteresis means being actuated by detector signals in the absence of an inhibiting signal, to set a single repeatable time interval between detection of natural heart activity signals and the generation of a first pace pulse independently of the regular time interval between pace pulses produced by said generator, the instant at which said hysteresis device is set being coincident with the natural heart activity signal,

g. means controlled by said hysteresis means for preventing said timing network in said pace pulse generator from producing a pace pulse for the duration of said repeatable time interval and for enabling production of a pace pulse at the end of said repeatable time interval, whereupon ensuing pace pulses at regular time intervals are determined by said pace pulse generator timing network and continue until a natural heart activity signal resets the repeatable time interval in said hysteresis device, and coincidentally inhibits said pace pulse generator for said repeatable time interval.

4,030,511

CONTROL SYSTEM FOR CIGARETTE PRODUCING AND PROCESSING MACHINES OR THE LIKE

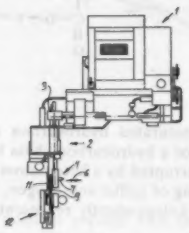
Günter Wahle, Reinbeck, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Continuation of Ser. No. 406,396, Oct. 15, 1973, abandoned, which is a continuation of Ser. No. 111,807, Feb. 2, 1971, abandoned. This application Oct. 15, 1974, Ser. No. 515,009

Claims priority, application Germany, Feb. 7, 1970, 2005665; May 6, 1970, 2022174

Int. Cl.[2] A24B 7/14

U.S. Cl. 131—21 R 9 Claims



1. In a production line for rod-shaped articles which constitute or form part of smoker's products, a combination comprising a machine for making rod-shaped articles, said machine having devices for draping flexible wrapping material around rod-like filler material for severing the draped filler material to form discrete rod-shaped articles and for conveying said discrete articles along a predetermined path, said devices having parts movable at a first speed and at a substantially higher second speed; prime mover means having variable-speed output means connected with said movable parts of said devices; first speed increasing means for accelerating said output means to said first speed; second speed increasing means for accelerating said output means from said first to said second speed at a slower first rate or at a faster second rate; and means for restricting said second speed increasing means to acceleration of said output means at said slower first rate.

4,030,512

HAIR LACQUER OR SETTING LOTION CONTAINING BI- OR TRI-SEQUENCED COPOLYMER

Christos Papantoniou, Epinay-sur-Seine, and Quintino Gaetani, Bondy, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Dec. 29, 1975, Ser. No. 645,211

Claims priority, application Luxembourg, Dec. 30, 1974, 71577

Int. Cl.[2] A45D 7/00; A61K 7/11

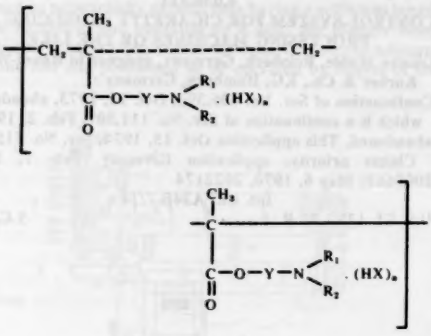
U.S. Cl. 132—7 11 Claims

1. A hair lacquer or hair setting lotion composition comprising in a solvent selected from the group consisting of water, ethanol, isopropanol, a liquified gaseous propellant, and a mixture thereof, 0.2 to 10 percent by weight of a bi- or tri-sequenced copolymer, the sequences in the chain of said copolymer having a schematic formula selected from the group consisting of

i. AAA—BBB

ii. AAA—BBB—AAA and

iii. BBB—AAA—BBB, A having the formula



wherein

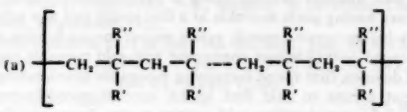
Y represents a saturated hydrocarbon chain having 2–4 carbon atoms or a hydrocarbon chain having 2–4 carbon atoms and interrupted by a heteroatom selected from the group consisting of sulfur and oxygen,

R_1 and R_2 each independently represent alkyl having 1–4 carbon atoms,

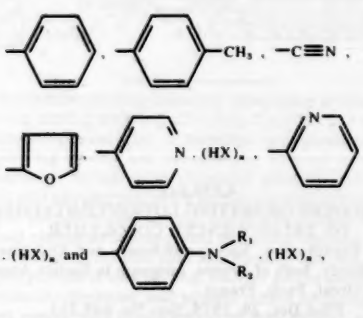
n is 0 or 1 and

HX represents an acid selected from the group consisting of hydrochloric acid, hydrobromic acid, lactic acid and acetic acid,

B having a formula selected from the group consisting of

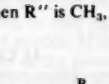


wherein when R'' is hydrogen, R' is selected from the group consisting of



and

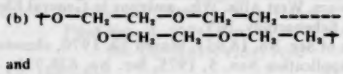
when R'' is CH_3, R' is selected from the group consisting of



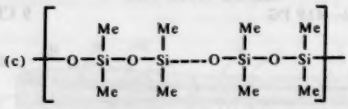
—$COOR_5$ and —COOH, wherein R_1, R_2, *n* and HX have the meanings given above, R_3 is a saturated hydrocarbon chain having 6–18 carbon atoms, R_4 is methyl or ethyl and R_5 is a saturated hydrocarbon chain having 1–18 carbon atoms,

b. —O—CH_2—CH_2—O—CH_2—CH_2 — — — O—CH_2—CH_2—O—CH_2—CH_2—

and



and



said bi- or tri-sequenced copolymer having a molecular weight between 1,000 and 1,000,000.

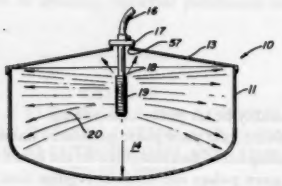
11. A process for styling or setting the hair comprising applying to the hair an effective amount of the composition of claim **1**, rolling the hair on rollers and applying external heat to the hair for a period of time ranging from 3 to 20 minutes to dry the same.

4,030,513

TANK WASHER

Wray V. McKenzie, Downers Grove, Ill., assignor to Babson Bros. Co., Oak Brook, Ill.

Filed Nov. 5, 1975, Ser. No. 628,890
Int. Cl.² B08B *3/02, 9/00*
U.S. Cl. 134—167 R **10 Claims**



1. In a tank washer apparatus having a liquid supply tube provided with a delivery end portion free of internal obstructions for delivering tank washing liquid, annular shoulder means on the distal end of said delivery portion, and mounting means for mounting the supply tube to a tank, the improvement comprising

a spray head rotatably carried by said supply tube and having means responsive to the delivery of washing liquid under pressure thereto from said delivery portion to rotate said spray head and provide a plurality of outwardly directed distributed streams of washing liquid moving transversely in a preselected tank washing spray pattern, said spray head including a plurality of internested annular elements in coaxial end-to-end relationship to define a tubular assembly thereof, adjoining pairs of said elements cooperatively defining spray ports for providing said streams of washing liquid, securing means outwardly of said supply tube for securing said elements in said end-to-end relationship to form a rotary spray head assembly, said shoulder means defining a coaxial annular bearing for rotatively supporting said assembly for rotation about the axis of the supply tube delivery portion.

4,030,514

SHORTENABLE UMBRELLA

Tilmann Schultes, Solingen-Weyer, Germany, assignor to Kortenbach & Rauh Kommanditgesellschaft, Solingen, Germany

Claims priority, application Germany, Aug. 9, 1975, 2535634
Filed July 26, 1976, Ser. No. 708,996
Int. Cl.² A45B *19/04*
U.S. Cl. 135—25 R **3 Claims**

1. A shortenable umbrella having blades carrying the um-

brella canopy in opened condition, the blades being shortenable at least by a factor of two by folding, and having a shortenable rod and a crown secured on the shortenable rod and at least one fork operatively connected to a slider displaceably disposed on the shortenable rod for pivoting the blades, comprising

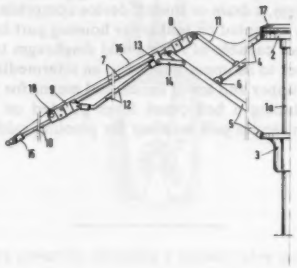
an innermost blade part being pivoted on said crown,

an outermost blade part having an extension,

a middle blade part operatively connected to said innermost and outermost blade parts, respectively,

a middle hinge pivotally connecting said middle blade part and said innermost blade part,

a control rod operatively connected said extension of said outermost blade part, said outermost blade part being hinged foldably onto said middle blade part by means of said control rod,



said control rod having an inner end, said control rod operatively enaging directly and positively without slipping on said outermost blade part,

a slide hinge pivotably fastened to said inner end of said control rod, said slide hinge being displaceably disposed on said middle blade part in the vicinity of said middle hinge,

a fork operatively connected to the slider and pivotally connected to said middle blade part at a first pivot point,

a short connecting rod pivotally connected to said fork at a second pivot point and to said slide hinge, the latter being articulated play-free operatively on said fork by means of said short connecting rod,

said short connecting rod being as little as possible longer than the distance between said second pivot point on said fork and said first pivot point of said fork on said middle blade part.

4,030,515

TELESCOPIC UMBRELLA

Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Canada

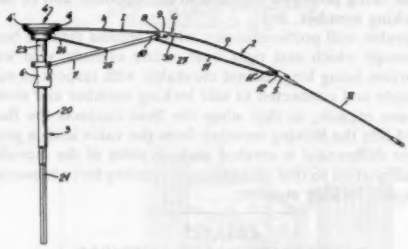
Filed July 19, 1976, Ser. No. 706,211

Claims priority, application Germany, July 21, 1975, 2532525; May 3, 1976, 2619052

Int. Cl.² A45B *19/04, 19/06*

U.S. Cl. 135—25 R **5 Claims**

1. An umbrella frame comprising a stick, a crown fixed at one end of the stick, a plurality of dome ribs hinged from the periphery of the crown, a main runner slidable on the stick, each dome rib including an inner and a middle section telescopic within the inner section, and an outer section hingedly connected to the outer end of the middle seciton for movement between a position colinear with the middle section and a position with the outer section folded over the middle section, a first geats slidable on the inner section, a stretcher member hinged to the main runner at one end thereof and to the geats at the other end thereof, a second geats member slidable on the inner section and connected to the end of the middle dome rib section, an auxiliary runner slidable on the stick between the main runner and the crown, a strut member hinged to the auxiliary runner and to the stretcher member, and a control link hinged to the stretcher member a short distance from the hinge point with the frist geats at one end thereof and at the ohter end the control member is hingedly connected to an inner extension of the outer dome rib section to form a quadrilateral with the middle dome rib section, the inner extension of the outer section and a portion of the stretcher member between the hinge point of the control link and the first geats, whereby as the main runner is slid on the stick away from the crown, the dome rib section can pivot



downwardly to a position parallel with the stick as the first geats member slides on the inner dome rib section, allowing the quadrilateral to be collapsed leaving the middle dome rib section and the outer dome rib section fully extended, and as the runner is further moved on the stick to a position beyond the length of the strut member, it will cause the geats to slide on the dome rib section away from the crown, and the control link will cause the outer dome rib section to fold onto the middle dome rib section.

4,030,516

FLOAT CONTROLLABLE VALVE

Werner Föller, Stuhr, Heiligenrode, Germany, assignor to Gestra-KSB Vertriebsgesellschaft mbH & Co. Bremen, Bremen, Germany

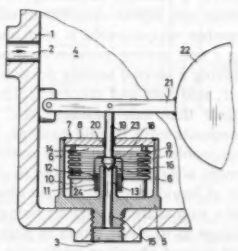
Filed Jan. 22, 1976, Ser. No. 651,657

Claims priority, application Germany, Jan. 28, 1975, 2503302

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.² F17T *1/20*

U.S. Cl. 137—192 **6 Claims**



1. A float controllable valve responsive to the level of fluid comprising:

a housing having an internal chamber including an input supply opening and a discharge opening;

a membrane capsule disposed in the interior of said housing and formed with at least a first throttle inlet bore communicative to the interior of said membrane capsule with the internal chamber of said housing at a pressure side, said membrane capsule including a rigid inlet nozzle extending into the interior of said membrane capsule and having a nozzle bore communicating with said discharge open-

ing, said inlet nozzle having a valve seat in the interior of said membrane capsule between the throttle bore and the nozzle bore;

a locking member slidably disposed and extending into the interior of said membrane capsule and having one end in sealing contact with said valve seat;

a pivotable lever arm having a float secured at one end and disposed outside of said membrane capsule and having its opposite end pivotably coupled to said housing, said lever arm being pivotable coupled to the opposite end of said locking member; and

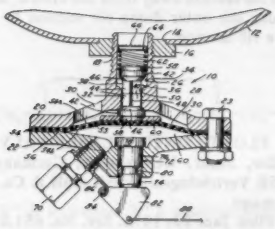
a movable wall portion formed with a second throttle bore through which said rigid inlet nozzle extends, said wall portion being longitudinal moveable with respect to said nozzle and connected to said locking member and membrane capsule, so that when the fluid contacts the float and lifts the locking member from the valve seat, a pressure differential is created on both sides of the movable wall portion so that an additional opening force is exerted on said locking member.

4,030,517

CONDENSATE VALVE ASSEMBLY

Kenneth E. Pyle, Marine City, Mich., assignor to Reef-Baker Corporation, Marine City, Mich.

Division of Ser. No. 546,736, Feb. 3, 1975, Pat. No. 3,977,426.
This application Dec. 15, 1975, Ser. No. 640,471
Int. Cl.² F16T *1/00*; F16K *31/126*
U.S. Cl. 137—203 **1 Claim**



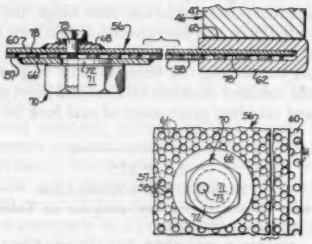
1. A condensate valve comprising a housing, an open-top liquid chamber in the upper portion of said housing for the accumulation of liquid, a liquid inlet to said liquid chamber, a second chamber in said housing beneath said liquid chamber having an outlet port, said housing having a partition separating said chambers, a passage extending downward through said partition from said liquid chamber to said second chamber, a valve member reciprocable in said passage, said valve member having a first sealing portion disposed in said liquid chamber and having a second sealing portion disposed in said second chamber, said first and second sealing portions being larger in diameter than said passage, said partition having valve seats at opposite ends of said passage, said sealing portions being engageable with said valve seats at the opposite limits of movement of said valve member to close said passage against the flow of liquid from said liquid chamber, said valve member between said sealing portions being so formed relative to said passage as to allow liquid to pass from said liquid chamber to said second chamber when said valve member is between its opposite limits, a flexible diaphragm defining the bottom of said second chamber, a fluid pressure chamber in said housing beneath and separated from said second chamber by said diaphragm, said valve member being movable by said diaphragm to its upper limit in response to fluid pressure in said pressure chamber, removable spring means in said liquid chamber for moving said valve member to its lower limit when the pressure in said pressure chamber is relieved, said housing comprising an upper part having said liquid chamber, said second chamber and said partition, a lower housing part having said pressure chamber, means removably securing said upper and lower housing parts together, said diaphragm being marginally clamped between said upper and lower housing parts, said valve member comprising upper and lower separable parts held in abutting relation by said spring means and said diaphragm, said upper part of said valve member having said first sealing portion and said lower part of said valve member having said second sealing portion, said valve member between said sealing portions being in the form of an elongated stem of reduced cross-section relative to said sealing portions, said upper part of said valve member being an integral piece composed of said first sealing portion and the upper end portion of said stem, said lower part of said valve member being an integral piece composed of said second sealing portion and the lower end portion of said stem, said upper part of said valve member being removable upon removal of said spring means through the open top of said liquid chamber and the lower part of said valve member being removable upon separation of said housing parts and removal of said diaphragm, a drain or shutoff device comprising a plunger reciprocably mounted on said lower housing part beneath said valve member capable of raising said diaphragm to raise said valve member to its upper limit or to an intermediate position between its upper and lower limits, and means for raising said plunger including a bell crank lever pivoted on said lower housing part, and a pull member for pivoting said bell crank lever.

4,030,518

AIR FLOW CONTROL APPARATUS

David E. Wilcox, Millbrae, Calif., assignor to Flanders Filters, Inc., Washington, N.C.

Division of Ser. No. 530,007, Dec. 5, 1974, Pat. No. 3,986,850.
This application July 30, 1976, Ser. No. 710,025
Int. Cl.² F16K *3/36*
U.S. Cl. 137—246 **10 Claims**



1. A valve for selectively and accurately regulating the volume of air flowing across a relatively large area and such that the volume of air flowing across all portions of the area is substantially uniform, said valve comprising

a first substantially flat plate having myriad relatively small, regularly spaced apertures extending therethrough,

a second substantially flat plate having myriad apertures extending therethrough, said apertures in said second plate being of a size and spacing generally corresponding to the size and spacing of the apertures in said first plate,

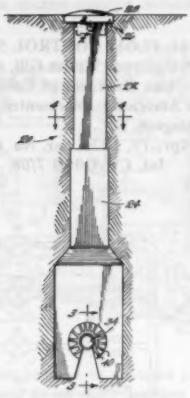
means for mounting said first and second plates in an overlying, relatively movable face to face relationship,

a non-evaporating fluid interposed between the full area of the opposing faces of said first and second plates, said fluid being adapted to prevent the flow of air laterally between said plates to thereby assure that the air flow through all portions of the overlying plates may be accurately controlled by the relative positioning of the apertures therein.

4,030,519
VALVE COVER FOR BURIED VALVE, PERMITTING ACCESS THERETO

Frank R. Zinn, Culpeper, Va., assignor to Bingham and Taylor, Culpeper, Va.

Filed Apr. 23, 1976, Ser. No. 679,748
Int. Cl.² F16L 58/00
U.S. Cl. 137—364 8 Claims



1. A valve cover for covering a buried valve and permitting access thereto comprising:

a hollow elongated housing member having opposed apertures adjacent one end thereof for each receiving a pipe section which extends therethrough with a valve between said sections being within said housing,

a cast collar attached to and covering at the opposite end of said member for permitting access to said valve when said housing and valve are in place, and

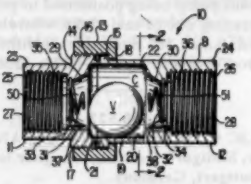
a plurality of flexible fingers each attached at one end to said housing about each of said apertures and extending outward therefrom to engage a pipe section to define a tapering passage for locking said valve and pipe sections securely to said cover.

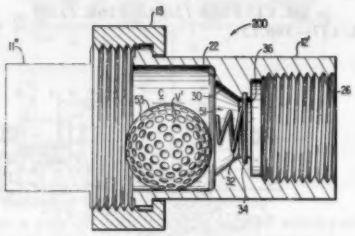
4,030,520
BALL-TYPE SAFETY VALVE

Asa D. Sands, 3606 Federal St., Camden, N.J. 08105

Filed Aug. 5, 1976, Ser. No. 711,977
Int. Cl.² F16K 15/00
U.S. Cl. 137—513.5 7 Claims

1. In a flow operated safety valve, the combination of a valve body defining a valve chamber having a longitudinal axis with flow passages at opposite ends of said axis, a cylindrical inner surface about said valve chamber, transverse walls at opposite ends of said valve chamber separating said valve chamber from said flow passages and defining annular shoulders at opposite ends of said chamber, a valve port through each of said transverse walls coaxial with said valve chamber, at least one of said valve ports being defined by a frusto-conical valve seat facing said chamber and by a cylindrical surface at the end of said valve seat remote from said chamber, an annular groove formed in said cylindrical surface of said one valve port, a convolute coil spring having a large end coil seated in said annular groove and tapering axially in the direction of said chamber to a small end located within the confines of said valve seat, a ball valve of smaller diameter than said chamber disposed in the chamber and movable toward and away from said valve seat, said safety valve body when in normal use being mounted in a flow line with its longitudinal axis horizontal so that said ball valve normally rests on the lowest portion of said cylindrical inner surface of said valve chamber out of contact with said valve seat and said spring, said ball valve being responsive to an excess rate of fluid flow above a predetermined maximum flow rate in the direction of said seat to move against said spring compressing same and seating upon said conical valve seat, thus substantially reducing the flow of fluid through said valve, and restricted leak passage means for bypassing fluid around said ball valve and said valve seat.

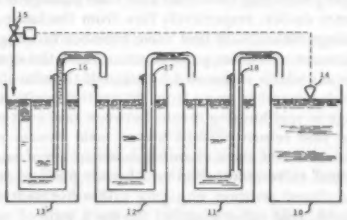




4,030,521
METHOD FOR LIQUID LEVEL CONTROL

Tom Orvar Björn Karlsson, Floda, Sweden, assignor to Nordnero AB, Kungalv, Sweden

Filed May 14, 1975, Ser. No. 577,318
Claims priority, application Sweden, May 16, 1974, 7406510
Int. Cl.² F04F 5/00
U.S. Cl. 137—566 2 Claims



1. A system for maintaining desired liquid levels in each tank of a multi-tank processing line for treating materials, said system comprising a line of several tanks having at least one processing tank on one end of said line and at least one rinsing bath tank on the other end of said line, whereby material to be treated travels tank by tank from said processing tank toward said rinsing bath tank, means for initially supplying liquid to the last rinse tank of the line responsive to a control by the liquid level in the first processing tank of the line, a plurality of air-lift pumps, at least one of the pumps being located between each of two individually associated neighboring tanks in said line of tanks to transport the excess liquid of one tank to the immediately preceding tank, with the direction of liquid transport being from said rinse tank toward said processing tank, whereby said material to be treated travels through said line in one direction and said liquid is transported through said

line in an opposite direction, the intake leading to the suction side of the associated one of said air-lift pumps forming an over flow level control in each of said tanks, and the pressure side of said air-lift pump being positioned to provide the inlet to the next preceding one of said tanks, whereby the liquid of each tank is maintained at a desired level without any danger of back flow from a preceding tank into a succeeding tank.

4,030,522

HYDRAULIC CONTROL VALVE ARRANGEMENT

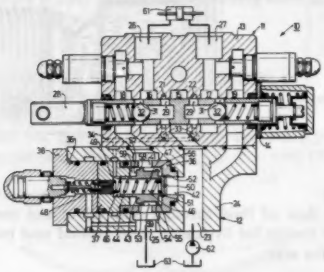
Joachim Heiser, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 18, 1975, Ser. No. 569,173

Claims priority, application Germany, Apr. 26, 1974, 2420242

Int. Cl.² F15B *13/042*; F16K *11/00*

U.S. Cl. 137—596.13 **7 Claims**



1. Hydraulic control valve arrangement for controlling flow of fluid to at least one fluid actuated consumer device, comprising housing means provided with inlet passage means connected to a source of hydraulic pressure fluid, consumer passage means connected to a consumer device, return passage means connected to a reservoir, and a bore intersecting said passage means; a first valve member movable in said bore between a neutral position preventing flow of fluid from said inlet passage means to the consumer device and from the latter to said return passage means, and a plurality of active positions for permitting flow from said inlet passage means to the consumer device, respectively flow from the latter to said return passage means, said first valve member forming a first throttle between said inlet passage means and the consumer passage means which varies as a function of the movement of said first valve member away from its neutral position; a bypass passage in said housing means between said inlet passage means and said return passage means, said bypass passage including a valve seat and a chamber downstream of said valve seat; a second valve member in said bypass passage movable between a closed position engaging said valve seat and an open position, said valve member having a pair of opposite first pressure faces, one of which being subjected to the fluid pressure in said inlet passage means and said second valve member including a piston portion having a pair of opposite ends in said chamber between said first pressure faces and having a diameter greater than the remainder of said second valve member, a first collar on one of said opposite ends of said piston portions which is adjacent said valve seat and having an outer peripheral surface closely adjacent to a peripheral surface defining said chamber and forming therewith a second throttle, and a damping collar on said piston portion axially spaced from said first collar and forming in said chamber to one side of said damping collar a damping chamber; control passage means communicating with said bore downstream of said first throttle and directing fluid pressure to the other of said first pressure faces so that said second valve member is biased by the pressure difference produced by said first throttle to said open position; spring means biasing said second valve member to said closed position; said opposite ends of said piston portions forming together with said first and second damping collars, respectively, a pair of second pressure faces, one of which is located downstream of said second throttle so that the pressure difference produced by said second throttle acts on said second pair of pressure faces to bias said second valve member in a direction opposite to the force produced by said spring means.

4,030,523

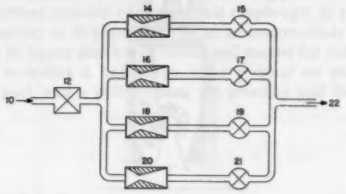
DIGITAL FLOW CONTROL SYSTEM

Robert E. Cram, Ridgecrest; Walter Gill, and James A. Loundagin, both of China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 677,944

Int. Cl.² G05D *7/06*

U.S. Cl. 137—599 **1 Claim**



1. A fluid flow control system having digital flow characteristics comprising:

an inlet port for admitting fluid flow to the system;

regulating means connected to said inlet port for assuring a predetermined pressure in said fluid flow to sustain downstream venturi action;

four manifold branches each connected to said regulating means providing fluid flow paths therefrom;

four clear-aperture, cavitation venturis one of which is mounted in each manifold branch to receive the fluid flow therein and having throat areas which are in the ratio of 1:2:2:5 to provide incremental decimally related fluid flow from said inlet port;

four bistable, electrically-actuated control valves one of which is mounted in each of said manifold branches for selectively controlling the fluid flow therein;

an electrical switch having five wafers and eleven positons;

an electrical energy source connected to inputs of each of said five wafers;

circuit means connecting said four bistable, electrically actuated control valves to four of the five wafers of said electrical switch such that each position of said switch sequentially steps said total flow rate from zero to full flow in ten percent steps;

means connected to the fifth wafer of said electrical switch for obtaining an electrical output indicative of the selected switch position corresponding to the selected percentage of full flow rate; and

an exit port connected to said four manifold branches for collecting the gas flow outputs therefrom into a single fluid flow stream for feed to a fluid utilization means.

4,030,524

COUPLER

Jack Alan McMath, Fort Thomas, Ky.; Paul R. Wilder, Cincinnati, Ohio, and Larry Lee Alderson, Valley Center, Kans., assignors to Dover Corporation, New York, N.Y.

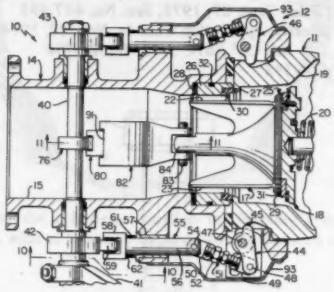
Filed May 19, 1975, Ser. No. 578,505

Int. Cl.² F16L *29/00*, *37/28*

U.S. Cl. 137—614.06 **19 Claims**

1. A coupler for receiving an adapter or the like having a passage therein and valve means to close the passage, said coupler including a body, means to lock and unlock the

adapter to said body, said locking and unlocking means being resiliently urged into its unlocking position, said body having a passage therein, valve means in said body passage and movable to an open position to provide communication between said body passage and the adapter passage, actuating means to move said valve means between its open and closed positions and to move said locking means to its locking or unlocking position, said valve means causing movement of the valve



means in the adapter passage to an open position when said valve means is moved to its open position by said actuating means, and latch means to prevent movement of said locking and unlocking means until said body has received the adapter in the position in said body in which said locking and unlocking means can lock the adapter to said body, said latch means preventing said actuating means from moving said valve means until said locking and unlocking means has locked the adapter to said body.

4,030,525

CORROSION-RESISTANT SHEET STEEL WELD

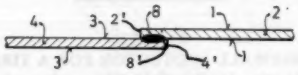
Gerd Bässler, Kornwestheim, and Arno Altpeter, Sindelfingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed July 18, 1975, Ser. No. 596,988

Claims priority, application Germany, July 18, 1974, 2434519

Int. Cl.² F16L *9/16;* **B32B** *15/18*

U.S. Cl. 428—586 **13 Claims**



1. Corrosion-resistant sheet steel weld in which two overlapping steel sheets (**2, 4; 10, 13; 18, 19; 21, 23, 26**) are placed with their respective end portions in overlapping relationships comprising

two overlapping steel sheets (**2, 4; 10, 13; 18, 19; 21, 23, 26**);

a coating of corrosion-resistant metal (**1, 3**) at adjacent, overlapping surfaces of said sheets;

a resistance weld seam (**8, 14, 38, 22**) formed at the interface of said sheets at least in the regions of the overlap of said projections and the other sheet;

and means providing for localized current density upon welding comprising openings (**5, 11, 20, 24**) formed in at least the end portions of at least one of the steel sheets extending from adjacent the outer edge of the end portion inwardly in said end portion leaving projections (**6, 15, 25**) between said openings, said openings having a depth less than the extent of overlap of said sheets.

4,030,526

MULTIPLE LOOM

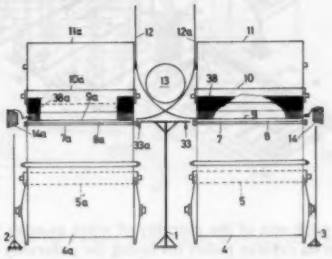
Christian Kiener, Eloyes, France, assignor to Tex International, S.A., Luxembourg, Luxembourg

Filed Mar. 29, 1976, Ser. No. 671,065

Claims priority, application Luxembourg, Apr. 11, 1975, 72272

Int. Cl.² D03D *33/00*

U.S. Cl. 139—18 **5 Claims**



1. An improved loom system comprising:

at least a pair of vertical looms located side-by-side and having harness means for forming sheds between vertical wrap yarns, the sheds being disposed on either side of and adjacent a common plane;

reed combs associated with the shed of each loom, each comb including an upper, substantially horizontal planar surface area across its width;

a weft feeder for each loom, each weft feeder comprising a flexible lance with a weft clamp at its extremity;

arcuate guide means for each weft feeder lance for guiding its travel in an arcuate path from a generally vertical to a generally horizontal direction parallel to and contiguous with the upper surface of the reed comb of its respective loom;

means for cyclically driving each weft feeder along its arcuate guide and through its respective shed in the manner of a reciprocating stroke;

said weft feeder guide means being disposed on either side of and adjacent said common plane extending between the sheds;

whereby said weft feeder lances are driven through the respective loom sheds in opposite directions on either side of and adjacent said common plane.

4,030,527

AUTOMATIC CABLE FORMING SYSTEM

Jacques L. Roch, San Jose, Calif., assignor to Xynetics, Inc., Santa Clara, Calif.

Filed June 21, 1976, Ser. No. 698,184

Int. Cl.² B21F *27/00;* **H01R** *43/00*

U.S. Cl. 140—92.1 **51 Claims**

1. An automatic cable forming system incorporating an X-Y positioner for automatically laying a plurality of individual wires in a predetermined pattern to form a complex cable, including

an array of individual spools each including a tensioning device to produce a predetermined tension on a wire as it is unspooled,

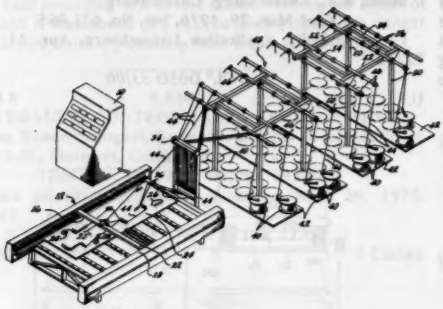
a plurality of individual capstan pulleys each receiving an individual wire from one of the spools,

a single capstan drive for engaging one capstan pulley at a time for individually feeding the plurality of wires from the spools,

a plurality of individual clamps for clamping the plurality of individual wires except the wire fed from the capstan pulley engaged by the capstan drive, and

a single wire head coupled to the X-Y positioner for receiving the wire fed from the capstan pulley engaged by the

capstan drive for laying the wire in a predetermined pattern and with the single wire head individually receiving each one of the plurality of wires as each wire is fed from its capstan pulley for laying the pulurality of wires in the predetermined pattern to form the complex cable.



4,030,528

MAGAZINE FOR BAGS SUCH AS SACKS

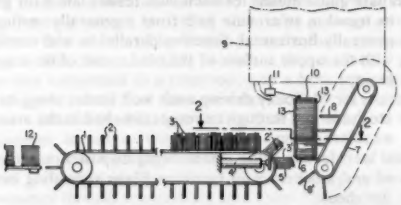
Bent Horning, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Oct. 28, 1975, Ser. No. 626,479

Claims priority, application United Kingdom, Oct. 28, 1974, 46449/74

Int. Cl.² B65B *3/00*

U.S. Cl. 141—1 **25 Claims**



15. A method for stacking bags such as sacks by transferring bundles of said bags from a first supply position to a second position for successive removal by filling spouts traversing a generally arcuate path about an associated packing apparatus, each bundle including at least one bag, which comprises:

a. successively placing said bundles of bags on a first bag transporting means having a bag receiving position and a bag discharging position;

b. transferring said bundles of bags to the bag discharging position of said first bag transporting means;

c. successively transferring said bundles of bags from the discharging position of said first bag transporting means to a second bag transporting means when said second bag transporting means is in a predetermined bag receiving position;

d. positioning and supporting said bags by said second bag transporting means in generally upright stacked relation adjacent the arcuate path of said filling spouts for successive removal thereof by said filling spouts;

e. monitoring the position relative to said filling spouts of the foremost bag of said stack of bags;

f. activating said second bag transporting means in response to signals provided when the position of the foremost bag is without a predetermined range due to successive removal of each foremost bag from said stack; and

g. activating said first bag transporting means to move at least one bundle comprising at least one bag to its bag discharging position in dependent response to the assumption by said second bag transporting means of a predetermined bag receiving position.

4,030,529

FILLER TUBE

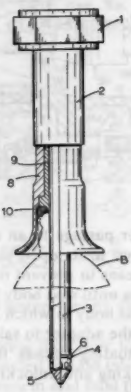
Alexander Ritchie Duncan, Scarborough, Canada, assignor to The Molson Companies Limited, Spruce Grove, Canada

Filed Sept. 29, 1975, Ser. No. 617,493

Claims priority, application Canada, Nov. 22, 1974, 214443

Int. Cl.² B67C *3/02*; **B65B** *3/04*

U.S. Cl. 141—392 **1 Claim**



1. A bottle filler tube assembly including a valve adaptor serving as the mounting for the upper end of an axially bored liquid filling tube of elongated tubular configuration, a downwardly and outwardly flared bottle centering housing slidably mounted on said tube, a gasket within said housing adapted to contact the upper end of a bottle to be filled, the tip of said tube being closed and tapered at 30° to the longitudinal axis of said tube, the lower end of said tube having a plurality of cirumferentially unobstructed spaced filler holes and a collar fixedly disposed on said tube adjacent the upper terminal end of said tip, the diameter of said collar being greater than the diameter of said tube and that of the upper terminal end of said tip whereby said collar acts as a stop limiting the amount of downward movement of said housing.

4,030,530

SIDEWALL PROTECTOR FOR A TIRE

Walter W. Curtiss, Jr., Brimfield, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

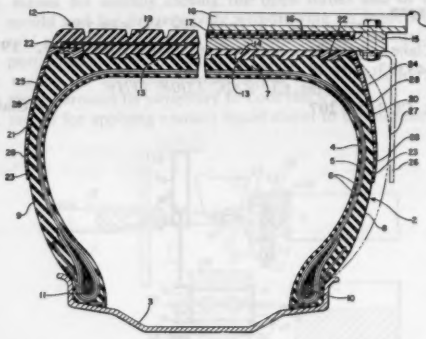
Filed Jan. 5, 1976, Ser. No. 647,273

Int. Cl.² B60C *27/00*

U.S. Cl. 152—187 **8 Claims**

1. In a tire comprising components of a tire carcass including at least one layer of reinforcement cords, a traction element and a pair of sidewalls which at least partially surround the carcass, the improvement comprising a non-rigid shield for covering and protecting at least one of the upper sidewall portions of the tire against punctures, the shield being separate from the portion of the sidewall which the shield covers such that stresses experienced by the sidewall during flexing will not be imparted to the shield, the shield being configured to at least engage the most deflected portion of the sidewall during flexing thereof, the shield being composed of elastomeric material which is sufficiently resilient to absorb cuts inflicted by sharp objects such as rocks, the shield being generally L-shaped, in section, and comprising, (I) an annulus for at least covering the adjacent upper sidewall portion, (II) a

cylindrical portion which is secured between the two components of traction element and tire carcass, and (III) means



carried by the cylindrical portion for forming a mechanical interlock with at least one of said two components of the tire.

4,030,531

METHOD AND APPARATUS FOR MONITORING AND OBVIATING DEFORMATIONS OF CONTINUOUS CASTINGS

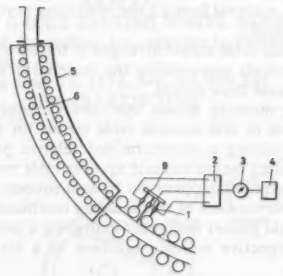
Klaus Wunnenberg, Duisburg, and Joachim Dubendorff, Krefeld, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Jan. 26, 1976, Ser. No. 652,364

Claims priority, application Germany, Feb. 4, 1975, 2504986

Int. Cl.² B22D *11/16*

U.S. Cl. 164—4 **11 Claims**



1. In the method of monitoring and obviating a critical deformation of a shell of a continuously cast casting which left a continuous casting mold and is guided from the mold by a supporting section including guiding rollers and subjected to the direct action of a coolant; which includes measuring relative to a reference line the bulging of a casting shell between two adjacent guiding rollers;

locating said guiding rollers at the solidification zone of the casting;

measuring the instantaneous distance of said guide rollers relative to said reference line;

sensing the differential between said measurements;

and controlling and regulating the speed at which the casting travels in accordance with the degree of said bulging as expressed by said differential.

4,030,532

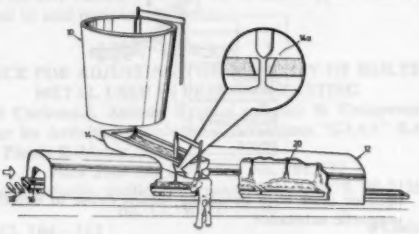
METHOD FOR CASTING STEEL INGOTS

Lars Tiberg, Fagersta, Sweden, assignor to Fagersta AB, Fagersta, Sweden

Continuation-in-part of Ser. No. 585,766, June 10, 1975, abandoned. This application May 25, 1976, Ser. No. 689,803

Int. Cl.² B22D *7/00*

U.S. Cl. 164—66 **13 Claims**



1. A method for casting steel ingots in molds comprising the steps of:

pouring the steel into elongated horizontal moldshaving an open upper surface to form ingots;

moving said molds longitudinally under a casting tundish at a uniform rate during casting;

maintaining the surface temperature of said ingots in the range of 40° below the liquidus temperature to 50° above the liquidus temperature of the steel for at least 10 seconds after casting so that the upper surface of said ingots remains fluid to allow slag inclusions to float to said upper surface;

solidifying said upper surface of said ingots between 10 seconds and 2 minutes after casting by lowering the ingot surface temperature to a temperature between solidus temperature and a temperature 100° C below solidus temperature, the solidifying of said upper ingot surface to occur before the interior of said ingot is solidified; and

maintaining said solidified upper surface at a temperature between the solidus temperature and a temperature 200° C below solidus temperature so that said upper surface is sufficiently hot to deform plastically when the interior of the ingot solidifies and shrinks to thereby reduce the formation of pores or segregates in the ingots.

4,030,533

CONTINUOUS CASTING SYSTEM

Yasuo Itoh; Yoshitake Suzuki, both of Kisarazu; Hirohiko Shibutami, Kitakyushu; Koichi Hirano, Kitakyushu, and Muneo Tagami, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Kabushiki Kaisha Yaskawa Denki Seisakusho, both of, Japan

Division of Ser. No. 588,698, June 20, 1975, Pat. No. 3,987,841. This application May 14, 1976, Ser. No. 686,362

Claims priority, application Japan, June 24, 1974, 49-71394

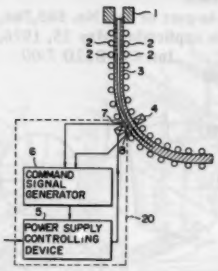
Int. Cl.² B22D *11/10, 11/16*

U.S. Cl. 164—147 **4 Claims**

1. A continuous casting system having an electromagnetic agitator, which comprises:

electromagnetic agitator control means operable to control operation of said electromagnetic agitator when a magnetic substance approaches same, and including first detecting means provided on the inlet side of said electromagnetic agitator for deenergizing said agitator upon detection of a magnetic substance approaching said agita-

tor, and second detecting means provided on the outlet side of said electromagnetic agitator for energizing said



agitator after both detecting means cease to detect the magnetic substance.

4,030,534

APPARATUS FOR CONTINUOUS CASTING USING LINEAR MAGNETIC FIELD FOR CORE AGITATION

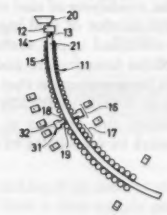
Yasuo Ito, and Yoshitake Suzuki, both of Kisarazu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 431,605, Jan. 8, 1974, Pat. No. 3,952,791. This application Jan. 14, 1976, Ser. No. 649,019

Claims priority, application Japan, Apr. 18, 1973, 48-46371

Int. Cl.² B22D *11/12*

U.S. Cl. 164—147 **4 Claims**



1. In a continuous casting apparatus having a mold, a device for withdrawing the cast object from the mold and a group of rolls along the path of the withdrawn cast object for supporting the cast object during withdrawal, the improvement comprising the combination of: a fixedly positioned non-rotatable electromagnetic agitator at a position along the path of the withdrawn cast object opposite the crater of molten metal within the cast object, said electromagnetic agitator having a core on opposite sides of the path of the cast object having a plurality of deep slots therein facing the cast object, coils wound around the cores at the bottoms of the deep slots, and a housing of non-magnetic material over the cores on opposite sides of the path of the cast object, said housing for the cores having a head over the portions of the cores between the slots, said housing protecting the core and the coils; and a plurality of roll sof non-magnetic material adjacent the magnetic agitator on opposite sides thereof in the direction of the path of the withdrawn cast object for supporting the cast object being withdrawn from the mold, said non-magnetic material rolls having a diameter from one-fourth to one-half that of the remainder of the rolls, and the pitch between the smaller diameter rolls being no greater than that between the larger rolls, said smaller diameter rolls being subdivided into at least two portions in the direction of their length.

4,030,535

MOLDING SYSTEM

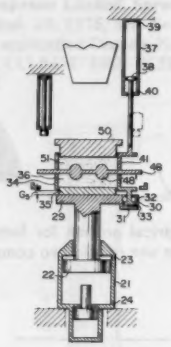
Yoshimi Saka, Suzuka, Japan, assignor to Hitachi Metals, Ltd., Japan

Filed Apr. 18, 1975, Ser. No. 569,292

Claims priority, application Japan, Apr. 19, 1974, 49-43393; July 24, 1974, 49-84151

Int. Cl.² B22C *15/08, 11/10*

U.S. Cl. 164—207 **8 Claims**



1. A molding system comprising:

a plurality of equidistantly spaced parallel pouring lines,

rail means extending at a right angle to said spaced pouring lines,

a truck means mounted for selective displacement along said rail means,

at least one pair of flaskless molding machines mounted on said truck means such that an alignment of one of said molding machines at one of said pouring lines automatically aligns the other of said molding machines with a next adjacent pouring line, each of said molding machines including:

a drag means for receiving a material forming a portion of a product mold,

a cope means arranged at the molding machine for receiving a material forming the remaining portion of the product mold,

a squeeze table means arranged at the molding machine for selectively compressing the material in said drag means and said cope means,

a drag memory means operatively connecting said drag means to said squeeze table means for memorizing and maintaining a predetermined relative position between said drag means and said squeeze table means at an end of a compressing operation by said squeeze table means.

and wherein each of said molding machines further include a mold pusher means for delivering a product mold from a respective molding machine to a respective pouring line.

4,030,536

APPARATUS FOR CONTINUOUS CASTING OF METALS

William Simon Rodenchuk, Montreal, and Anthony Garth Eccles, Oakville, both of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Division of Ser. No. 465,552, April 30, 1974, Pat. No. 3,933,192. This application Nov. 3, 1975, Ser. No. 628,321

Claims priority, application United Kingdom, Apr. 30, 1973, 20553/73

Int. Cl.² B22D *11/08*

U.S. Cl. 164—274 **8 Claims**

2. In apparatus for continuously casting a substantially rectangular section ingot in combination

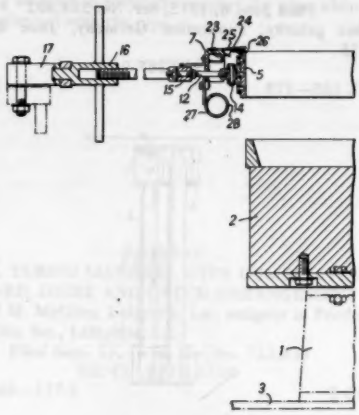
a. a rectangular mould adapted to receive and contain a

supply of molten metal, said mould having an open outlet end and side walls formed of heat conductive metal,

b. means for initially closing the open outlet end of the mould and for progressively withdrawing an ingot from said mould at a controllably variable rate as the surface portion of said ingot solidifies,

c. means for applying coolant liquid to the walls of the mould around its periphery to cool the walls,

d. means for applying coolant liquid direct to the surface of



the emerging ingot at a position adjacent the outlet end of said mould, the

e. means for progressively curving at least the long side walls of said mould convexly outwardly, about an axis of curvature parallel to the direction of advance of metal through the mould, during the performance of the casting operation, each of said side walls being curvable about said axis throughout substantially its full cooled extent in said last-mentioned direction to and including the margin of the side wall at the mould outlet end.

4,030,537

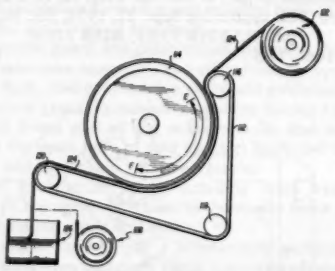
THIN GAUGE CASTING WHEEL BAND

George C. Ward, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed June 25, 1975, Ser. No. 590,236

Int. Cl.² B22D *11/06*

U.S. Cl. 164—278 **5 Claims**



1. In a machine for continuously casting molten metal wherein a flexible band is guided into closed relationship with an arcuate portion of the peripheral groove of a rotatable casting wheel to form a casting mold, and including means for applying a coolant to the external surface of the flexible band to conduct heat from said band and solidify the molten metal, the improvement comprising a porous support belt arranged to support and urge said band into engagement with the casting wheel peripheral groove over said arcuate portion, said means for applying the coolant being arranged to supply the coolant to said band through said porous support belt, said support belt being guided away from and returned to said peripheral groove by a plurality of guide wheels, said flexible band being wound upon itself to form a roll thereof, and including means for feeding said flexible band from said roll into closed relationship with said peripheral groove at the point on said casting wheel at which said support belt is returned to said peripheral groove.

4,030,538

DEVICE FOR ADJUSTING THE QUANTITY OF MOLTEN METAL USED IN PRESSURE CASTING

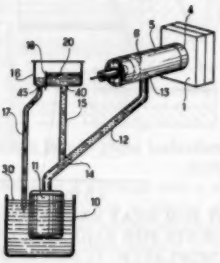
Henri Carbonnel, Antony, France, assignor to Groupement pour les Activities Atomiques et Advancees "GAAA" S.A., Le Plessis Robinson, France

Filed June 30, 1976, Ser. No. 701,277

Claims priority, application France, July 7, 1975, 75.21254

Int. Cl.² B22D *17/30*

U.S. Cl. 164—312 **4 Claims**



1. A device for adjusting the quantity of molten metal used in pressure casting, the device comprising:

a supply container for molten metal,

a pump operatively positioned with respect to said molten metal supply container for pumping molten metal upwardly from said supply container,

a pressure chamber positioned above said supply container for injecting molten metal into a mold,

a rising pipe connecting said pump to said pressure chamber to feed molten metal to said pressure chamber,

a level-determining tank positioned above said supply container at the level of said pressure chamber and having a level-determining overflow,

a branch pipe rising from a fork in said rising pipe and connected to the bottom of said level-determining tank for continuous feeding of molten metal to said level-determining tank in parallel with said pressure chamber whereby, in operation, the level of molten metal in said pressure chamber, and hence the quantity supplied to the mold, is determined by the level of said overflow in said tank; and

a return pipe projecting downward from the bottom of said level-determining tank to the side of said overflow opposite said branch pipe for returning the overflowing metal in said tank to said supply container.

4,030,539

CROSS-CURRENT PIPE HEAT-EXCHANGER FOR GASES

Manfred Stute, Esslingen, and Eggert Tank, Fellbach, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Aug. 28, 1974, Ser. No. 501,365

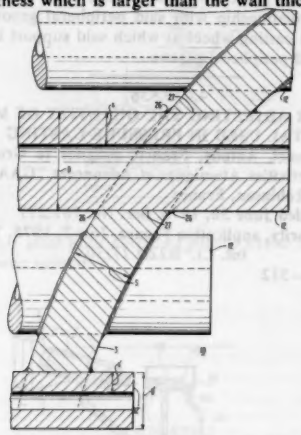
Claims priority, application Germany, Aug. 28, 1973, 2343310

Int. Cl.² F28F *9/04*; F28D *7/06*

U.S. Cl. 165—134 **24 Claims**

1. A heat-exchanger comprising: a plurality of individual

heat-exchanger pipes, means for directing the flow of a heat-absorbing gas through said individual heat exchange pipes, means for fixedly connecting each of said individual heat exchange pipes to said flow directing means, at least some of said plurality of individual heat exchange pipes at least at the area of connection with said flow directing means having a wall thickness which is larger than the wall thickness of the



remaining individual pipes of said plurality of individual heat exchange pipes.

4,030,540

TUBE NEST FOR HEAT EXCHANGERS, AND MODULAR ELEMENTS FOR SAID NEST CONSISTING OF THERMOPLASTIC TUBES, AND PROCESS FOR MANUFACTURING THE MODULAR ELEMENTS AND THE TUBE NESTS

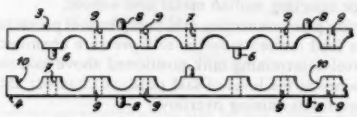
Carlo Roma, Rome, Italy, assignor to Belleli Industrie Meccaniche S.p.A, Italy

Filed Mar. 21, 1973, Ser. No. 343,196

Claims priority, application Italy, Apr. 20, 1972, 49783/72

Int. Cl.² F28F *9/26*

U.S. Cl. 165—172 **3 Claims**



1. A tube nest for heat exchanger which is easily constructed from flexible modular elements spirally windable on a reel comprising:

a. a plurality of modular elements forming a rectangular box shaped structure, each module being stackable, flexible and planar;

b. each modular element comprising a combination a plurality of flexible thermoplastic tubes in a parallel and spaced apart single layer arrangement, a plurality of rigid spacers each comprising two parts, each part having an inner face with semicircular grooves and an outer flat face such that when said two parts are mated, parallel and spaced apertures are formed to retain said thermoplastic tubes of the modular element, pins and bores adjacent at least some of said semicircular grooves on the inner faces of each part forming a connection means to connect said two parts to form said rigid spacer;

c. abutting modular elements joined at abutting flat surfaces of said rigid spacers by outer pins and bores as coupling means in said flat surfaces, said coupling means aligning the tubes of adjacent modular elements in either staggered or in-line position; and

d. a tube head being mounted on the ends of said plurality of tubes.

4,030,541

MULTI-ELEMENT TYPE RADIATOR OF PLASTIC MATERIAL

Erwin Gross, Burgsolms, and Hans Vowinkel, Florsheim am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 6, 1975, Ser. No. 584,402

Claims priority, application Germany, June 8, 1974, 2422715

Int. Cl.² F28F *9/02*

U.S. Cl. 165—175 **3 Claims**

1. A multi-element radiator made of plastic material and comprising vertical water pipes connected to upper and lower collecting channels, each radiator element being composed of a plurality of said vertical pipes connected at their upper and lower ends to relatively thin-walled cylindrical tube sections of substantially uniform diameter and the end-faces of adjacent tube sections being connected to form horizontal tubular channels of substantially uniform diameter along the length thereof, the ends of said pipes being of diminished cross-section at their junctions with said tube sections and being aligned with a radius of said tube sections.

4,030,542

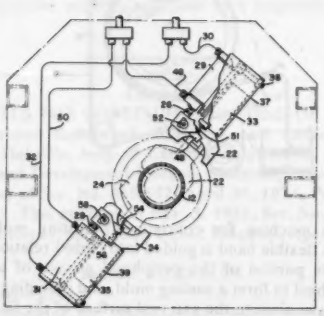
DRILL STRING MAKE-UP AND BREAK-OUT MECHANISM

Curtis Eugene Poe, Reynoldsville, and Ronald Murray Cheers, Bridgeport, both of W. Va., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation-in-part of Ser. No. 618,792, Oct. 2, 1975, abandoned. This application Sept. 22, 1976, Ser. No. 725,679

Int. Cl.² E21B *33/03;* **B25B** *13/50*

U.S. Cl. 166—77.5 **13 Claims**



1. A drill string make-up and break-out mechanism for use

on a drill platform comprising; a pair of pipe-holding members mounted on the drill platform and circumferentially spaced adjacent the drill pipe, each pipe-holding member having a stop member connected thereto adapted to contact grooves formed in the drill pipe, the grooves in the drill pipe being constructed and the stop members being constructed so that one stop member prevents rotation of said pipe in one direction; and the other stop member prevents rotation of said pipe in the other direction; and means for fluidly simultaneously actuating said pipe-holding members, said pipe-holding members being adapted to vertically support the pipe when actuated into contact with the pipe.

4,030,543

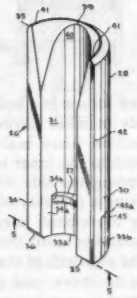
WELL TUBING MANDREL WITH COMBINATION GUARD, GUIDE AND LATCH ARRANGEMENT

Ferdinand M. McGinn, Lafayette, La., assignor to Production Specialties, Inc., Lafayette, La.

Filed Sept. 13, 1976, Ser. No. 722,535

Int. Cl.² E21B *23/00*

U.S. Cl. 166—117.5 **2 Claims**



1. In a mandrel for use in a well tubing including:

a. a body having an open bore extending therethrough for alignment with the well tubing;

b. a valve receptacle formed in said mandrel body and offset from the open bore of said body;

c. combination guard and guide means formed at the upper end of said valve receptacle and offset from the open bore of said body, said combination guard and guide including:

1. a body of generally semicircular shape having a portion which forms part of the mandrel body that is offset from the open bore of said mandrel body and is adjacent and above said valve receptacle;

2. said semicircular body including sides extending toward the open body bore to define the front of said combination guard and guide;

3. said sides each having a substantially vertical edge extending from the upper to the lower end of said body;

4. a tapering surface formed on the upper end of said body and extending generally inwardly and downwardly to form an opening in said guard and guide of a desired configuration to restrict access to said valve receptacle immediately therebelow; and

d. projection means adjacent the lower end of said semicircular body and extending inwardly of said semicircular body to form lug means to assist in retaining a valve in said valve receptacle.

4,030,544

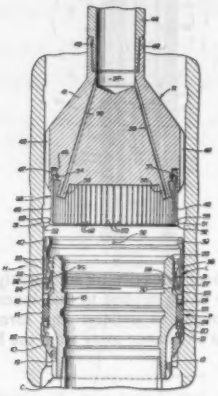
WELLHEAD SEAL APPARATUS AND PULLING TOOL FOR RELEASING AND RETRIEVING SUCH APPARATUS

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Division of Ser. No. 475,586, June 3, 1974, Pat. No. 3,944,273. This application Nov. 24, 1975, Ser. No. 634,366

Int. Cl.² E21B *23/00*

U.S. Cl. 166—182 **11 Claims**



1. In seal apparatus between a wellhead and a hanger disposed in the wellhead for supporting a tubular pipe string extending into a well bore: packing means; locking means for locking said packing means in sealing relation to the hanger including a locking member actuable longitudinally to lock said locking means and retractable to release said locking means and packing means; said locking member having a circumferentially continuous pulling shoulder; and pulling tool means including instrumentalities deflectable inwardly by said locking member to enable said instrumentalities to move past said shoulder to a position therebelow, said instrumentalities deflecting outwardly under said shoulder for engagement with the underside of said shoulder to retract said locking member.

4,030,545

APPARATUS FOR CLEANSING WELL LINER AND ADJACENT FORMATIONS

Rostislav Nebolsine, 64 E. 86th St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 539,111, Jan. 7, 1975, Pat. No. 3,945,436. This application Mar. 15, 1976, Ser. No. 666,976

Int. Cl.² E21B *33/124, 33/127, 43/25*

U.S. Cl. 166—191 **7 Claims**

5. Apparatus for cleaning well liners having apertures or the walls of an open cavity, and the adjacent underground formations, comprising:

at least two substantially elongate outer pipe sections adapted to be positioned within a well, said outer pipe sections being positioned in substantial vertical, spaced axial alignment;

an inner, flexible pipe extending through and including means for supporting said outer pipe sections and having means on one end adapted to be connected to a high pressure fluid source;

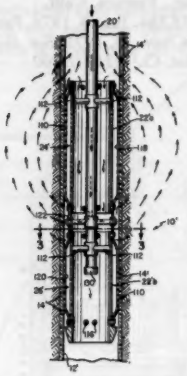
at least two elongate packers, each of said packers surrounding a respective one of said outer pipe sections;

a flexible material connecting adjacent ends of adjacent outer pipe sections, thereby defining flexible joints so that said adjacent pipe sections and the respective packers associated therewith are articulated;

means defining a fluid outlet communicating with said inner

flexible pipe and communicable with the adjacent underground formations; and

said packers each having a length such that the sealed



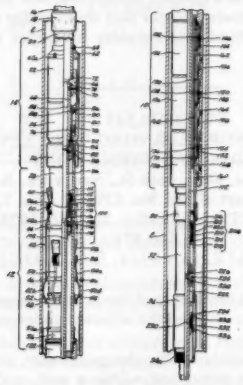
lengths of the liner or cavity are sufficiently long to cause the fluid, upon being applied to said inner pipe, to flow outwardly through the underground formation in arc-shaped paths at a distance away from the liner or cavity.

4,030,546

SWIVEL ASSEMBLY

Jerry L. Rogers, New Orleans, La., and Chudleigh B. Cochran, Houston, Tex., assignors to Brown Oil Tools, Inc., Houston, Tex.

Filed July 28, 1975, Ser. No. 599,628
Int. Cl.² E21B *43/10*
U.S. Cl. 166—208 **27 Claims**



1. A swivel device comprising:

a. generally tubular housing means;

b. core means rotatably carried within said housing means;

c. fluid seal means between said housing means and said core means, defining a plurality of fluid chamber means between said housing means and said core means;

d. fluid pressure communicating passage means interconnecting each of said fluid chamber means;

e. bearing fluid means contained within said fluid chamber means and said fluid pressure communicating passage means to function as load bearing means and as rotational bearing means between said housing means and said core means; and

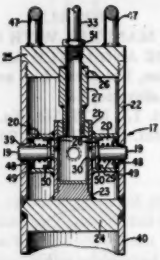
f. said fluid chamber means arrayed such that load, supported by said bearing fluid means in said fluid chamber means as load bearing means, is generally equally distributed among said fluid chamber means.

4,030,547

APPARATUS FOR CRYOTHERMAL FRACTURING OF ROCK FORMATIONS

Sigmund L. Ross, Brooklyn, N.Y., assignor to Rose Shuffman, Executrix, Scarsdale, N.Y.

Division of Ser. No. 523,887, Nov. 14, 1974, Pat. No. 3,978,921, which is a continuation-in-part of Ser. No. 148,048, May 28, 1971, Pat. No. 3,759,329, which is a continuation-in-part of Ser. No. 823,306, May 9, 1969, Pat. No. 3,581,821. This application Apr. 29, 1976, Ser. No. 681,740
Int. Cl.² E21B *43/26, 23/04*
U.S. Cl. 166—212 **3 Claims**



2. An anchoring device for use in a hole in a rock formation which comprises a body member having peripheral surface dimensioned for disposition when inserted in said hole in proximate spaced relation to the inner side wall of said hole, gripping means for gripping the side wall of said hole, said gripping means comprising a plurality of pistons mounted on said body member for movement laterally outwardly with respect to said body member until the ends thereof make pressure contact with the side wall of the hole, means responsive to pressurized gas to move said pistons outwardly to establish said ends thereof in gripping relation with said side wall, gas supply means connected to said body member for supplying gas into operative relation with said pistons for moving said pistons outwardly to establish the ends thereof in gripping relation with said side wall, said gas supply means comprising a valve which controls supply of pressurized gas into said operative relation with said pistons, and means for moving said valve to open position when said anchoring means has been positioned in said hole to thrust said pistons outwardly responsive to release of pressurized gas and thereby establish said ends thereof in gripping relation with the side wall of the hole.

4,030,548

ECONOMICALLY DISSOLVING BARIUM SULFATE SCALE WITH A CHELATING AGENT

Edwin A. Richardson, Houston, and Ronald F. Scheuerman, Bellaire, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 28, 1976, Ser. No. 680,937
Int. Cl.² C02B *5/06*; C23F *14/02*; E21B *43/27*
U.S. Cl. 166—279 **5 Claims**

1. A process for dissolving barium sulfate solid from a remote location into which fluid can be flowed comprising:

flowing fluid into the remote location so that a stream of fluid contacts and flows along the surfaces of the barium sulfate solid, and

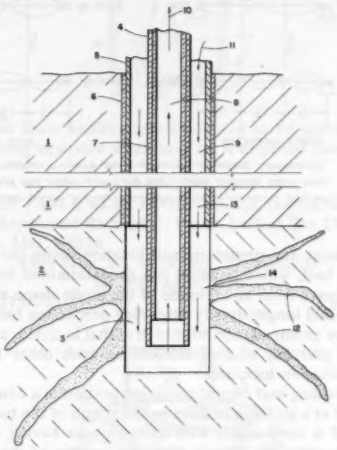
adjusting the composition and flow rate of the fluid so that (a) the barium sulfate solid is contacted by a stream of aqueous solution in which each portion contains enough dissolved aminopolyacetic acid salt chelating agent to be effective in dissolving barium sulfate scale, (b) substantially all upstream portions of the barium sulfate solid are contacted by succeeding portions of the aqueous solution that are substantially unsaturated with respect to the dissolved barium-chelant complex, and (c) said aqueous solution contains from about 0.02–0.05 moles per liter of the chelating agent.

4,030,549

RECOVERY OF GEOTHERMAL ENERGY

Larry S. Bouck, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed Jan. 26, 1976, Ser. No. 652,022
Int. Cl.² E21B *43/24*; F28F *19/00*; F28D *21/00*
U.S. Cl. 166—280 **12 Claims**



1. A process for the formation of a structure for the transfer of energy between a locus in a borehole and a subterranean formation comprising:

a. drilling a borehole from the surface into the formation,

b. fracturing and propping the formation adjacent to the locus by injecting a reactive slurry into the formation at a pressure above the fracturing pressure of the formation, the slurry comprising finely divided aluminum and a reactive metal oxide in a fluid carrier,

c. igniting the reactive slurry within the formation so that the aluminum and the metal oxide therein react to form a liquid metal within the fracture system formed in the formation, and

d. allowing the liquid metal in the formation to cool and solidify within the fracture system.

4,030,550

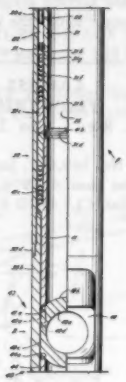
METHOD OF OPERATING A SUBSURFACE SAFETY VALVE IN RESPONSE TO AN INCREASE OR DECREASE IN AMBIENT WELL FLUID PRESSURE

James D. Mott, Houston, Tex., assignor to Hydril Company

Division of Ser. No. 566,202, April 9, 1975, Pat. No. 3,987,849, which is a continuation of Ser. No. 399,455, Sept. 21, 1973, abandoned, which is a division of Ser. No. 214,679, Jan. 3, 1972, Pat. No. 3,788,594. This application Jan. 7, 1976, Ser. No. 646,993
Int. Cl.² E21B *43/12*
U.S. Cl. 166—314 **10 Claims**

6. A method of operating a well fluid ambient pressure responsive subsurface safety valve disposed in a well tubing to control the flow of well fluids through the bore of the tubing to control the flow of well fluids through the bore of the tubing including the steps of:

sensing with the safety valve both increasing and decreasing pressure changes in the well fluid pressure in the bore of



the well tubing from a preselected ambient well fluid pressure for operating the safety valve; and

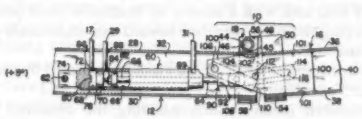
closing the safety valve to block flow through the bore of the well tubing at the sursurface location responsive to either sensed pressure change in the bore of the well tubing.

4,030,551

FOLDING FLEX TOOLBAR

Charles Boetto, Naperville; Wayne L. Orkwiszewski, Romeoville, and Donald E. Connor, Plainfield, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 12, 1976, Ser. No. 676,090
Int. Cl.² A01B *15/14*, *73/00*
U.S. Cl. 172—126 **13 Claims**



1. In an articulated sectional tool bar for carrying agricultural earth-working tools, in combination, a normally horizontal main tool bar section and an outer wing section, an offset hinge connecting said sections in end-to-end relationship for swinging movement of the wing section between a normal lowered operative earth-working position where such tools as may be carried thereby may follow a rolling terrain, and a slightly inclined raised inoperative position where such tools are clear of the ground for implement turnabout purposes, a crank arm on said wing section, a hydraulic cylinder pivotally mounted on the main section and having a positive displacement piston therein and a cooperating plunger capable of moving a full stroke projecting therefrom and which is responsive to the stroke of the said positive displacement piston, said cylinder provided with an internal abutment which determines the forward limited motion of the positive displacement piston, said positive displacement piston being effectively engageable with said plunger during forward movement of the former to transmit its limited motion to the plunger to move

the plunger a fraction of its full stroke and to raise the wing section to its slightly inclined raised inoperative position, a hydraulic fluid line in communication with said cylinder rearwardly of said positive displacement piston and effective when pressurized to drive said positive displacement piston forwardly, and means effective between the outer end of the plunger and said crank arm for applying torque to the latter to thereby raise said wing section progressively during outward projection of the plunger under the influence of said positive displacement piston.

4,030,552

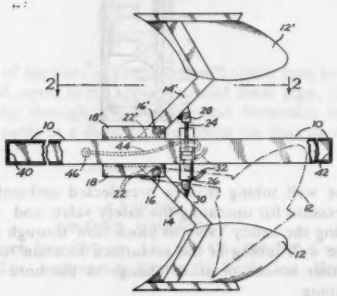
PLOW TRIP

Glen Armon Watts, Rte. 1, Box 258, McMinnville, Oreg. 97127

Continuation of Ser. No. 369,981, June 14, 1973, abandoned. This application June 4, 1976, Ser. No. 692,937

Int. Cl.² A01B *65/00*

U.S. Cl. 172—663 **3 Claims**



1. In combination with a plow having a support, a ground-working plow member mounted on the support for movement relative thereto-between an outwardly extended this position and an inwardly retracted position,

a. a fluid pressure piston-cylinder unit operatively interconnecting the support and plow member, the piston-cylinder unit having a piston rod of substantially smaller diameter than the cylinder bore extending fro one end of the cylinder.

b. means communicating only the piston end of the cylinder of said unit with a source of hydraulic fluid pressure for urging the plow member toward said outwardly extended position,

c. a constant volume sealed chamber carried by the support and containing only compressible gas, and

d. conduit means communicating the chamber with the piston rod end of the cylinder for confining compressible gas only for movement between the piston rod end of the cylinder and the chamber during extension and retraction of the piston-cylinder unit.

4,030,553

PERCUSSION TOOL WITH NOISE REDUCING CHARACTERISTICS AND METHOD OF MAKING

Thomas H. Rockwell, 11801 Summers Road, Chesterland, Ohio 44026

Filed June 23, 1975, Ser. No. 589,022

Int. Cl.² B25D *17/12, 17/24*

U.S. Cl. 173—1 **13 Claims**

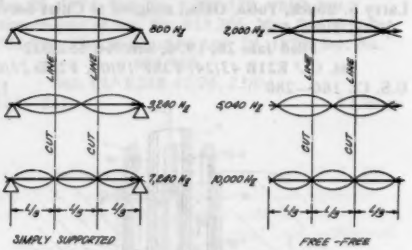
1. A method of constructing a longitudinally extending percussion tool of predetermined length for use in combination with an apparatus having means for delivering longitudinally directed impacts to an impact receiving portion of the tool, said method comprising the steps of:

a. operating a longitudinally extending monolithic prototype percussion tool of said predetermined length having an impact receiving portion and a working end portion by impacting the tool to generate the resonant audible noise frequencies radiated by the prototype tool during use;

b. identifying a resonant audible noise frequency radiated over the length of the prototype tool during operation;

c. establishing a mode shape for the longitudinally extending percussion tool by determining the resonant mode shape for the prototype tool which corresponds to the frequency identified in step (b);

d. providing a plurality of tool sections, each of predetermined length and which when joined to each other form a tool having an impact receiving portion and a working end portion and having a length equal to the length of the monolithic prototype tool and a strutural discontinuity at



APPROXIMATE SHAPES OF THE FIRST THREE SIMPLY-SUPPORTED AND FREE-FREE BENDING MODES. THE CUT LINES SHOW THE LOCATIONS OF THE THREADED JOINTS RELATIVE TO THE MODE SHAPES.

at least one predetermined location along the length of the tool, which location is a predetermined longitudinal distance from an antinode of the mode shape established for said longitudinally extending percussion tool to introduce an impedence mismatch at that location, and joining the plurality of tool sections to each other to form a percussion tool; and

e. providing said impact receiving portion in a configuration and at a location relative to the length of the tool that the tool is combinable with an apparatus having means for impacting the impact receiving portion of the tool with the impact receiving portion of the tool disposed for engagement with the impacting means.

4,030,554

BORE HOLE AIRHAMMER AND ANVIL BIT

Archer W. Kammerer, Jr., Columbus, N.C., and Alfred R. Curington, Inman, S.C., assignors to Bakerdrill, Inc., Spartanburg, S.C.

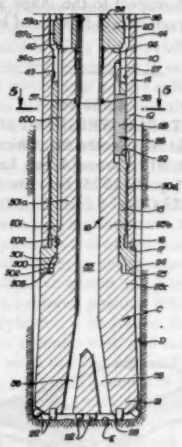
Filed July 7, 1975, Ser. No. 593,692

Int. Cl.² B23Q *5/027*

U.S. Cl. 173—17 **26 Claims**

15. Percussion drilling apparatus: comprising an anvil bit adapted to be impacted against by a hammer piston; said anvil bit having bleeder passage means including an upper inlet portion opening through the upper extremity of said anvil bit, said passage means extending downwardly in said anvil bit to

a lower outlet portion located above the lower end of said anvil bit; said anvil bit having a peripheral sealing portion



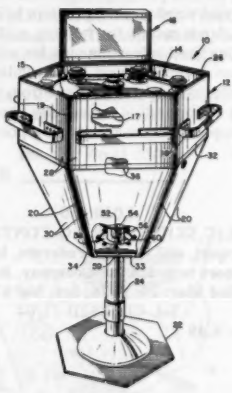
below said lower outlet portion adapted to be sealed against by a housing structure when said bit is disposed therein.

4,030,555

WIGGLE TABLE ELECTRONIC BALL GAME DEVICE

John G. Boyce, and Richard G. Boyce, both of Box 249, Carlsbad, N. Mex. 88220

Filed Mar. 15, 1976, Ser. No. 666,939
Int. Cl.² A63F 7/16
U.S. Cl. 273—110 **12 Claims**



1. A game of skill device comprising a cabinet, a field of play supported within said cabinet, a ball freely supported upon said field of play and movable by gravity upon the surface thereof;

a pedestal pivot means interposed between said cabinet and said means urging said field of play into a horizontal position and which yieldably resists movement in any direction away from a horizontal position;

a stop means for limiting the magnitude of angular displacement toward which said field of play can be urged in a direction away from a horizontal position;

and means forming a lock device by which said field of play can be locked into a fixed position respective to said pedestal whereby said field of play can no longer be tilted in a direction away from said locked position;

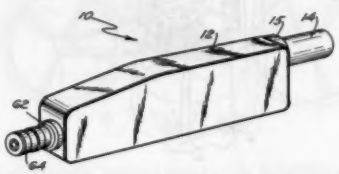
said lock device includes a magnetically actuated armature, means by which said armature is removably captured between said cabine and said pedestal at a location spaced from said pivot means in such a manner that relative movement therebetween can be effected only when the armature is displaced from captured relationship to said cabinet and pedestal.

4,030,556

MINIATURE IMPACT TOOL

Raymond J. Phillips, 879 Raymond Hill Road, Oakdale, Conn. 06370

Filed Sept. 22, 1975, Ser. No. 615,453
Int. Cl.² B25D 1/00
U.S. Cl. 173—120 **6 Claims**



1. A miniature impact tool comprising:

rotary means adapted for being driven in a rotary motion;

linear reciprocating means abutting said rotary means for converting the rotary motion to a linear motion, said linear reciprocating shock including a toolholder, said toolholder including a cylindrical flange located on an intermediate portion of said toolholder, said toolholder including a body that is cylindrically shaped for a predetermined axial distance on one side of said cylindrical flange, the end of said one side of said toolholder away from said cylindrical flange having a segment of circle cross-sectional area forming a flat area in the axial direction extending from said cylindrical shape, the other side of said cylindrical flange being cylindrically shaped and having threading and an aperture arrangement adapted to hold a tool at the end of said other side away from said cylindrical flange;

a threaded sleeve connected to said toolholder threading;

a housing enclosing said rotating means and a substantial portion of said linear reciprocating means, said housing including a housing aperture, said housing aperture having an outer section enclosing a portion of said toolholder including said flange and being of a diameter larger than the diameter of said toolholder flange and said housing aperture having an inner section enclosing a portion of said toolholder and being of a diameter smaller than said toolholder flange; and

retaining means for retaining said toolholder including **0** rings encircling and abutting a portion of said toolholder positioned on both sides of said toolholder flange, and a retainer having an aperture for insertion of said toolholder, said retainer inserted in the outer portion of said housing aperture and connected to said housing, said retainer located for abutting one of said **0** rings.

4,030,557

WELL DRILLING APPARATUS AND METHOD

Robert L. Alvis, and Melvin M. Newsom, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

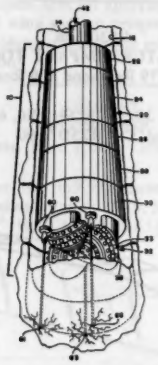
Filed May 3, 1976, Ser. No. 682,806
Int. Cl.² E21B 7/00
U.S. Cl. 175—4.5 **6 Claims**

1. In a drilling apparatus utilizing drilling mud under pres-

sure and comprising drill string and drill bit, and improvement comprising:

at least one barrel from which projectiles may be impelled;

at least one magazine for containing a plurality of said projectiles;



means responsive to drilling mud pressure for moving a projectile from said magazine into, through, and out of said barrel; and

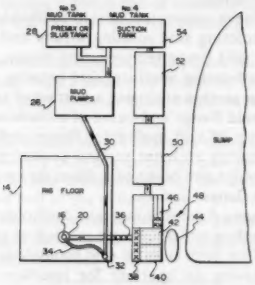
means integral with said projectile for firing said projectile upon its exit from said barrel to impel said projectile into rock to be drilled.

4,030,558

WEAR DETERMINATION OF DRILLING BITS

H. Rodney Morris, 1932 - 26th Ave. SW., Calgary, Alberta, Canada

Filed Sept. 15, 1975, Ser. No. 613,323
Int. Cl.² E21B *13/00*
U.S. Cl. 175—39 **25 Claims**



1. In a rotary drilling operation, a method for determining the wear of the bit comprising the steps of:

circulating a drilling fluid through the borehole and around the bit with sufficient velocity to remove the formation cuttings and the cuttings, fragments and dust worn loose from the bit,

placing a magent in sufficiently close proximity to the removed cuttings, fragments and dust to attract a portion of the ferrous cuttings, fragments and dust present therein to the magnet thereby separating the ferrous material for the removed formation cuttings,

removing the attracted ferrous material from the magnet,

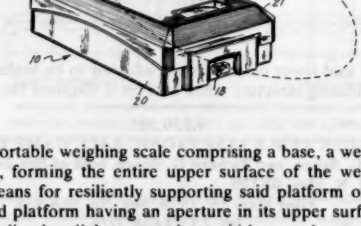
examining the ferrous material under an image magnification device suitable for the observation of the shape and color of the cuttings and fragments forming a portion of the ferrous material so as to permit an evaluation of the observed shape and color of the ferrous cuttings and fragments with respect to the shape and color of ferrous cuttings and fragments indicative of known conditions of rotary bit wear.

4,030,559

PORTABLE WEIGHING SCALE

Leonard A. Fish, 21 W. Geothe St., Chicago, Ill. 60610, and Robert L. Moore, 919 Coronet Lane, La Grange, Ill. 60525

Filed May 19, 1975, Ser. No. 578,889
Int. Cl.² G01G *23/02, 23/14, 21/08*
U.S. Cl. 177—159 **15 Claims**



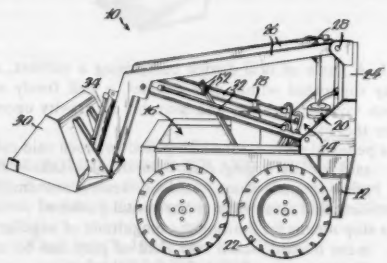
1. A portable weighing scale comprising a base, a weighing platform, forming the entire upper surface of the weighing scale, means for resiliently supporting said platform on said base, said platform having an aperture in its upper surface, a weight-indicating dial supported on said base and operatively connected with said platform for rotating in response to a weight resting on said platform to provide an indication of the magnitude of said weight, said indication being visible through said aperture, latch means for holding said dial in weighting-indicating position, and release means for selectively releasing said latch means, whereby said weight-indicating dial can be inspected after said weight is removed from said platform, said release means incorporating a manually operable latch releasing control supported by said base at a position remote from said platform.

4,030,560

HYDRAULIC SKID STEERING CONTROL SYSTEM

Donald J. Parquet, and Carl O. Pedersen, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 29, 1976, Ser. No. 671,627
Int. Cl.² B62D *11/04*
U.S. Cl. 180—6.48 **7 Claims**



1. In a skid steer vehicle having a vehicle body with first and second ground engaging members on opposite sides of said body, first and second fluid translating devices connected to the respective ground engaging members for operation in the

forward and reverse directions and having an arm movable in opposite directions from a neutral position by a manually actuated lever, and a connection between each arm and lever, each connection comprising a master cylinder having a master piston slidable therein with a direct connection between said master piston and said lever, a slave cylinder having a slave piston slidable therein and connected to said arm, a first conduit connecting one end of said master cylinder to one end of said slave cylinder to define a first hydraulic chamber on one side of said pistons and including a portion of each of said cylinders, a second conduit connecting an opposite end of said master cylinder to an opposite end of said slave cylinder to define a second chamber on an opposite side of said pistons and including a portion of each of said cylinders, first biasing means cooperating with said master piston and normally maintaining said master piston in a centered position intermediate opposite ends of said master cylinder, second biasing means cooperating with said slave piston and normally maintaining said slave piston in a centered position intermediate opposite ends of said slave cylinder, a hydraulic fluid reservoir connected to said master cylinder with said master cylinder having first and second ports in close proximity to opposite sides of said master piston when said piston is in a centered position so that both said chambers are in communication with said reservoir, whereby movement of said control lever in either direction from a neutral position will move said master piston and block one of said ports so that said slave piston is moved as a function of movement of said master piston by transfer of hydraulic fluid between said cylinders and said first and second biasing means will return both pistons to centered positions, when said lever is released, so that both chambers are again in communication with said reservoir.

4,030,561

SAFETY KICKSTARTER FOR MOTORCYCLES

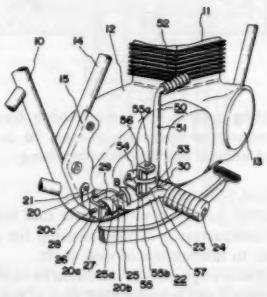
Michiyoshi Hashimoto, and Hisahumi Shako, both of Asaka, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1976, Ser. No. 653,636

Claims priority, application Japan, Feb. 5, 1975, 50-16770[U]

Int. Cl.² B62J *25/00*

U.S. Cl. 180—33 R **4 Claims**



1. In a motorcycle, in combination, a kickstarter pivotally mounted on the motorcycle for pivotal movement between a working and a retracted position, and a footrest pivotally mounted on the motorcycle adjacent the kickstarter for pivotal movement between a working and a retracted position, and means on said kickstarter and footrest for permitting the kickstarter to be pivotable to its working position only when the footrest is in its retracted position, while when the footrest is in its working position the kickstarter is locked against pivotal movement to its working position.

4,030,562

MOTOR AND PEDAL PROPELLER CYCLE

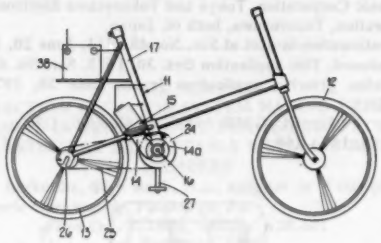
Peter Watson Leighton, Burnley, and Charles Patrick Duncan Davidson, Droitwich, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jan. 21, 1976, Ser. No. 650,877

Claims priority, application United Kingdom, Feb. 27, 1975, 8177/75

Int. Cl.² B62K *11/00*

U.S. Cl. 180—34 **14 Claims**



1. An electrically assisted pedal cycle including a frame, a ground engaging wheel rotatably mounted on the frame, a pedalshaft supported by the frame with its axis extending transverse to the plane of the frame, the shaft being supported for rotational movement and limited axial movement relative to the frame, coupling means whereby rotation of the shaft relative to the frame at least in one direction can be transmitted to said ground engaging wheel to propel the cycle, means operable by rotation of the shaft in said one direction to move the shaft axially relative to the frame in one axial direction, electrical switch means operable by axial movement of the shaft relative to the frame in said one axial direction, an electric motor and associated power source carried by the frame, the electric motor being capable of driving said ground engaging wheel, and said electrical switch means being so associated with the electric motor and its associated power source that energisation of the elector motor is dependent upon operation of said electrical switch means.

4,030,563

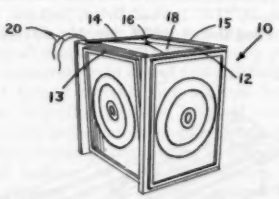
SPEAKER SYSTEM OF CUBIC CONFIGURATION

Edward F. Zinna, 244 Bay 13th St., Brooklyn, N.Y. 11214

Filed Sept. 16, 1976, Ser. No. 723,723

Int. Cl.² H04R *1/40*

U.S. Cl. 181—147 **10 Claims**



1. A speaker system for use in the home or office, and which is designed for hanging from a ceiling or support on a flat surface such as a table, comprising: four speakers each having a thin thickness, said four speakers being arranged to form a cubic arrangement where each one of said speakers forms one of the four side surfaces of the cubic arrangement, two of said speakers lying diametrically opposed to one another and each being canted at an acute angle relative to a vertical plane perpendicular to the other two of said four speakers so that

the bottom edge surfaces of said two speakers lie closer together than the top edge surfaces thereof; a top panel connecting the top edge surfaces of said four speakers; and means on said top panel for attaching said top panel to a ceiling or the like, whereby said two speakers face downwardly toward the floor when hung from a ceiling via said means for attaching and allow for a maximum efficiency of the system.

4,030,564

LOUD SPEAKER WITH STABLE DAMPING

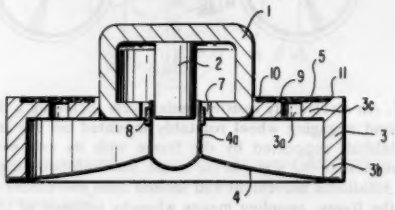
Tadasi Itagaki, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo and Tokorozawa Electronic Corporation, Tokorozawa, both of, Japan

Continuation-in-part of Ser. No. 481,411, June 20, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,415

Claims priority, application Japan, June 28, 1973, 48-76021[U]

Int. Cl.² G10K *13/00*; **H04R** *7/00*, *1/28*

U.S. Cl. 181—166 **5 Claims**



1. In a loud speaker of the type having an annular frame concentrically surrounding a central magnet and supporting said magnet by means of transversely extending wall portion fixed to one edge of the annular frame and including a central yoke upon which said magnet is mounted and having a diaphragm fixed at its periphery to the other edge of said annular frame remote from said wall portion, the improvement comprising: air communication holes within the wall portion of said frame facing said diaphragm, and a regularly woven metal wire gauze covering the air communication holes to provide stable vibration damping to the loud speaker diaphragm, and wherein said air communication holes extend through the wall portion of the frame in a circumferentially spaced array, the surface of said wall portion of said frame is recessed annularly and said metal wire gauze comprises a unitary annular strip fixed to the surface of the wall portion remote from said diaphragm and fixedly carried within said recess and overlies all of the holes.

4,030,565

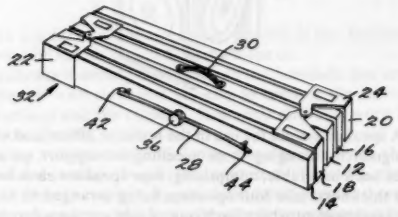
COLLAPSIBLE SAWHORSE PACKAGE

Reynald Chaput, 5140 Inwood Drive, Jackson, Mich. 39206

Filed Dec. 3, 1975, Ser. No. 637,412

Int. Cl.² F16M *11/00*

U.S. Cl. 182—151 **5 Claims**



1. A collapsible sawhorse package comprising:

two pivotally movable gripping brackets each having a pair of legs mounted therein so that said legs are movable between open and closed positions, said pairs of legs being positioned oppositely from one another so that the legs within said pairs are positioned alternately on opposite sides of a centrally located ridge board, wherein each said gripping brackets holds one end of said centrally located ridge board and at least one leg of the opposite pair of legs, said ridge board and each of said legs is provided with at least one opening extending therethrough, wherein each opening is positioned along said ridge board and said legs respectively so that when said ridge board and said legs are formed into said package the openings are aligned and securing means for maintaining said package in a rigid condition, said securing means includes a pin, said pin having a length sufficient to allow the pin to at least pass through the aligned openings in the package formed from said ridge board and said legs and holding means for holding said pin within said aligned openings so as to secure said ridge board and said legs together.

4,030,566

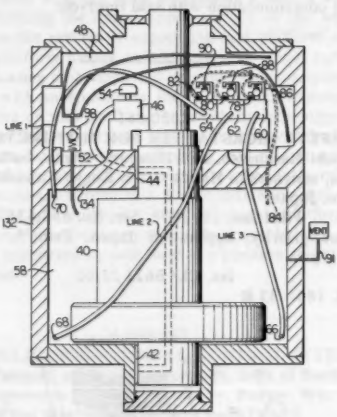
HYDRAULIC SYSTEM FOR ROCK BREAKER

Delwin E. Cobb; George J. Jackson; Richard E. Livesay, all of Peoria County, and Orrin A. Stemler, Tazewell County, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 28, 1975, Ser. No. 626,384

Int. Cl.² F01M *3/00*

U.S. Cl. 184—6.2 **7 Claims**



1. A lubricating system for a mechanism having movable elements and tiltable in operation at least 90 degrees from a first position of normal operation, comprising:

a housing;

a shaft support bearing in said housing;

a rotatable shaft rotatably mounted in said bearing;

a scavenge compartment in said housing for collecting oil subsequent to lubrication of said shaft;

a plurality of scavenge pumps mounted in said housing and having separate inlets so located that at least one inlet is submerged in oil in said compartment regardless of the orientation of said housing;

an oil collection tank for receiving oil from said scavenge pumps;

deaeration means disposed between said scavenge pumps and said collection tank for removing air from said oil prior to delivery of said oil to said tank;

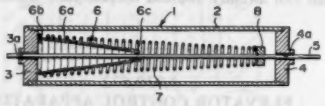
a lubrication pump for drawing oil from said tank and supplying a quantity of said oil for lubricating said shaft; and

vent means for communicating air and vapors from said oil collection tank to said scavenge compartment.

4,030,567
SPRING DRUM

Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Tokyo and Fuji Photo Film Co., Ltd., both of, Japan

Filed July 8, 1976, Ser. No. 703,608
Claims priority, application Japan, July 11, 1975, 50-96545
Int. Cl.² F03G 1/00; A47G 5/02
U.S. Cl. 185—37 **10 Claims**

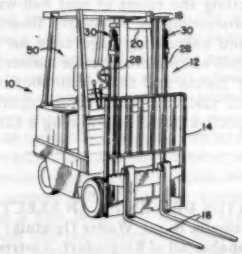


1. A spring drum for driving a web-like member by a spring force comprising in combination:
a cylindrical drum,
a shaft extending through said drum coaxially therewith, said cylindrical drum and said shaft being rotatable relative to each other,
a cone shaped member having a bottom end of largest diameter and a top end of smallest diameter, said cone shaped member being provided within said drum coaxially therewith, said shaft extending through said cone shaped member, and
a cone shaped coil spring having a bottom end of largest diameter and a top end of smallest diameter, said cone shaped coil spring being provided within said drum coaxially therewith and around said cone shaped member, the bottom end of said coil spring being fixed to the bottom end of said cone shaped member,
one end of said coil spring being fixed to one of said drum and said shaft, and the other end of said coil spring being fixed to the other of said drum and said shaft.

4,030,568
HIGH VISIBILITY MAST FOR LIFT TRUCKS

Lloyd K. Heinold, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 24, 1976, Ser. No. 670,030
Int. Cl.² B66F 9/06
U.S. Cl. 187—9 E **5 Claims**

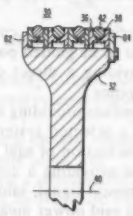


1. In a lift truck, a mast assembly supported on said truck, said mast assembly comprising: a pair of vertically extending laterally spaced-apart mast uprights, said mast uprights each including inner and outer relatively movable telescoping members, load bearing carriage means including forks thereon supporting a load to be lifted, said carriage means being movably mounted upon said mast uprights, carriage lift actuator means mounted upon said mast uprights for selectively moving said carriage means relative to said outer members, said lift actuator means being mounted upon said mast uprights entirely laterally outwardly thereof, thereby leaving the space between said mast uprights unobstructed for good operator visibility, said actuator means including a pair of hydraulic jacks having cylinder portions and rod portions extendible from said cylinder portions, said cyliner portions being fixedly mounted upon said outer members, and chain means connected at first and second points to said outer members and said carriage, respectively, sheave assembly means for said chain means, said sheave assembly means being mounted upon and movable with said rod portions of said hydraulic jacks, wherein said sheave assembly means include a sheave support member and vertically extending pin means and flange plate means mounted upon said inner members for engaging said pin means upon extension of said rod portions to transmit movement of said rod portions to said inner members.

4,030,569
TRACTION ELEVATOR SYSTEM HAVING CABLE GROOVE IN DRIVE SHEAVE FORMED BY SPACED, ELASTICALLY DEFLECTABLE METALLIC RING MEMBERS

Harry Berkovitz, Glen Rock, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 7, 1975, Ser. No. 620,441
Int. Cl.² B66B 11/08
U.S. Cl. 187—20 **6 Claims**

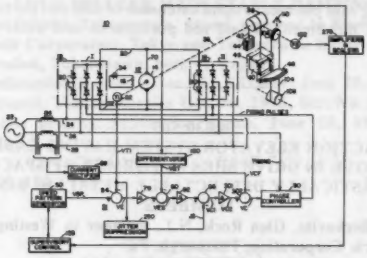


1. An elevator system, comprising:
an elevator car,
a counterweight,
drive means including a drive motor connected to a drive sheave, said drive sheave having a periphery rotatable about a drive axis,
cable groove means on the periphery of said sheave which defines at least one cable groove,
and a cable interconnecting said elevator car and said counterweight while disposed about said drive sheave in said at least one cable groove,
said cable groove means including first and second independent, metallic ring portions spaced apart along the drive axis of said drive sheave, each of said first and second metallic ring portions including a washer shaped portion having inner and outer edges and first and second opposed parallel surfaces, and a projecting portion which extends outwardly from one of said parallel surfaces, said first and second metallic ring portions being disposed with the projection portions adjacent one another to cooperatively define the cable groove, said inner edges of the washer shaped portions being in contact with predetermined surfaces of said drive sheave, said washer shaped portions of the first and second metallic ring portions being elastically and rotatably deflectable towards one another about predetermined circumferential longitudinal axes, from unstressed positions by said cable acting on said outwardly extending projecting portions, with the magnitude of the rotational deflections being proportional to forces in the cable, said first and second metallic ring portions increasing their surface area in contact with the cable as the washer shaped portions rotatably deflect, to increase the tractive effort between the drive sheave and cable when said drive motor rotates said sheave.

4,030,570
ELEVATOR SYSTEM

William R. Caputo, Wyckoff, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1975, Ser. No. 639,336
Int. Cl.² B66B *1/28*
U.S. Cl. 187—29 R **14 Claims**

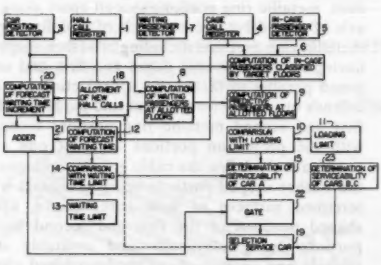


1. An elevator system comprising:
an elevator car mounted for vertical movement in a guided path,
drive means including a direct current motor for driving said elevator car in its guided path,
power means providing a direct current voltage for said direct current motor,
jitter suppression means providing a jitter suppression signal proportional to a selected system parameter which may cause vertical oscillation of said elevator car,
and control means providing a control signal modified by said jitter suppresson signal, said modified control signal being applied to said power means to control the magnitude of the direct current voltage applied to said direct current motor while attenuating vertical oscillation of said elevator car.

4,030,571
ELEVATOR CONTROL SYSTEM

Takashi Kaneko; Takeo Yuminaka; Tatsuo Iwasaka, and Hiroshi Kinoshita, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 18, 1975, Ser. No. 569,401
Claims priority, application Japan, Apr. 22, 1974, 49-44507; June 5, 1974, 49-62898
Int. Cl.² B66B *1/18*
U.S. Cl. 187—29 R **15 Claims**

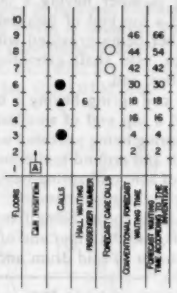


1. An elevator control system for controlling a plurality of elevator cars arranged for parallel operation for servicing a plurality of service floor landings of a building, comprising hall call registering means disposed at each floor, cage call registering means disposed in each said car for registering a cage call instructing target floors, means for generating a signal representative of a car position, means for computing the service condition of each said car for hall calls in response to said car position signal, means for selecting suitable ones of said cars for servicing a new hall call, and means responsive to said selecting means for allotting said new hall call to said selected cars, said servicing car selecting means comprising means for computing a forecast of the changed service condition of each said car for the hall calls allotted thereto already when said new hall call originated from one of the floors is provisionally allotted thereto, and means for selecting a car to service said new hall call whose changed service condition for each hall call already allotted thereto falls within acceptable limits.

4,030,572
ELEVATOR CONTROL APPARATUS

Takashi Kaneko; Tatsuo Iwasaka, and Takeo Yuminaka, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 8, 1975, Ser. No. 620,761
Claims priority, application Japan, Oct. 11, 1974, 49-116102
Int. Cl.² B66B *1/18*
U.S. Cl. 187—29 R **14 Claims**



1. In an elevator system comprising cage call register means, hall call register means and a plurality of elevator cars in juxtaposition serving a plurality of floors in response to said cage call register means and said hall call registers means; an elevator control apparatus comprising means for detecting the number of waiting-prospective passengers on each floor hall, means for setting the ratios of said hall-waiting-prospective passengers proceeding to respective floors, and means for forecasting and calculating cage calls on the basis of said number of hall-waiting-prospective passengers detected by said detector means and said destination ratios set by said setting means, said cage calls being registered by said hall waiting-prospective passengers joining a car.

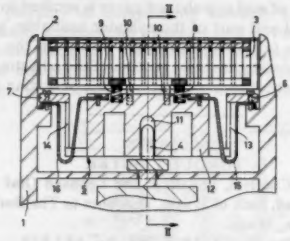
4,030,573
APPARATUS DRIVEN BY AN ELECTRIC MOTOR

Leo Buzzi; Valentin Buzzi; Walter Opietnik; Helmut Liebl, and Peter Malobabic, all of Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,119
Claims priority, application Austria, Jan. 10, 1975, 156/75
Int. Cl.² F16F *7/10*
U.S. Cl. 188—1 B **9 Claims**

9. An electromotively driven housed apparatus construction comprising a reciprocatingly driven vibratory element having a plane of movement, first hinge means hingeably coupling one side of said element in said plane of movement to the housing of said apparatus, second hinge means hingeably coupling the other side of said element in said plane of movement to the housing of said apparatus, a first resilient spring-like member coupled between said element and said housing for exerting a first force in said plane of movement between said housing and said element, and a second resilient spring-

like element for exerting a second force, opposite to said first force, in said plane of movement between said housing and said element, said resilient springlike elements taking up alter-



nately occurring tensile and pressure loads, thereby relieving said hinges of said loads and thus substantially increasing the life of said hinges.

4,030,574

RAIL WHEEL GRIPPERS

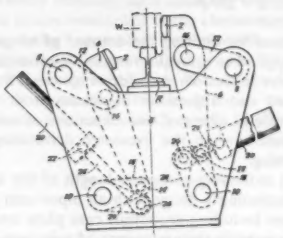
David Arthur Evans, Bristol, England, assignor to Strachan & Henshaw Limited, Bristol, England

Filed Jan. 7, 1976, Ser. No. 647,084

Claims priority, application United Kingdom, May 19, 1975, 21259/75

Int. Cl.² B61K *7/08*

U.S. Cl. 188—62 **15 Claims**



2. A rail gripper for use upon at least one wheel of a rail vehicle running on a rail of a track for the vehicle, and comprising, in combination, opposed clamping members adapted to respectively grip opposite sides of said wheel, a mounting mechanism for each clamping member, support means for each said mounting mechanism each said mounting mechanism comprising, an upwardly extending carrier arm having an upper region on which said clamping member is secured and a lower region remote from said upper region, means pivotally connecting said support meand to said carrier arm lower region comprising a first pivot arm having respective pivot axes on the support and the carrier arm lower region, guide means separate and independent of said firs pivot arm and pivotally connected to said support and said carrier arm upper region said guide means having a pivot axis on the carrier arm upper region, said carrier arm having an axis defined by and extending between said upper and lower region pivot axes, said first pivot arm having an axis defined by and extending between the pivot axes thereof, said carrier arm axis and first pivot arm axis together defining an included angle, said carrier arm and said first pivot arm being relatively displaceable to increase said included angle from a first inoperative position wherein said clamping member is lowered to substantially the level of said rail to a second operative position wherein said clamping means is raised to engage said wheel, and drive means connected to said mechanism for displacing said carrier arm and said first pivot arm.

4,030,575

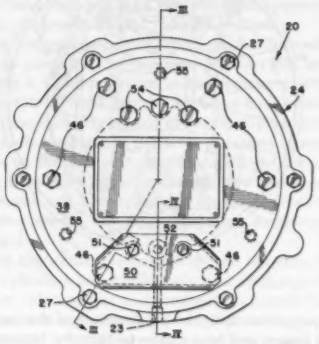
PISTON ASSEMBLY WITH SAFETY VENT MEANS FOR BRAKES AND THE LIKE

Rodger L. Moring, Bristol, and Richard E. Frauenhoff, Montgomery, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 22, 1975, Ser. No. 624,792

Int. Cl.² B60T *11/30*

U.S. Cl. 188—71.1 **18 Claims**



1. A piston assembly adapted for use in a brake or clutch comprising

a piston having an opening formed therethrough,

a pressure plate disposed in axial alignment with respect to said piston,

a plurality of fastening means releasably attaching said piston to said pressure plate, and

cover means comprising a substantially flat plate detachably mounted directly on an outboard side of said piston and disposed thereon to cover said opening in sealing relationship therewith and having an end portion extending inwardly towards said piston to fully cover at least one of said fastening means whereby said cover means must be detached from said piston prior to release of the fastening means covered thereby.

4,030,576

DISC BRAKE ASSEMBLY INCLUDING A SELF-CONTAINED ACTUATOR WITH WEAR TAKE-UP AND ANTI-DRAG DEVICE

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

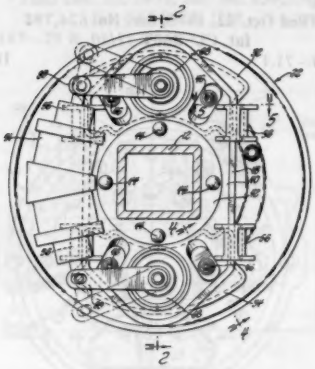
Division of Ser. No. 567,126, April 11, 1975, Pat. No. 3,974,897. This application Apr. 16, 1976, Ser. No. 677,693

Int. Cl.² F16D *65/74*

U.S. Cl. 188—71.8 **18 Claims**

1. A brake assembly comprising: a friction disc, a brake shoe, a suppport plate mounted adjacent said friction disc, guide pins extending between said support plate and said brake shoe for movably supporting said brake shoe, return spring means for urging said brake shoe toward said support plate, a self-contained actuator carried by said support plate for urging said brake shoe toward said friction disc; said actuator including a cylinder, an actuated piston within said cylinder operatively engaging said brake shoe, an actuating piston, a rotatable threaded shaft member for translating rotational motion to axial motion operatively connected to said actuating piston, means for rotating said shaft member, a fluid-filled chamber between said actuated and actuating piston defining a fluid link therebetween whereby axial movement of said actuating piston causes axial movement of said actuated piston, wear take-up and anti-drag means for permitting substantially free forward movement of said actuated piston in unison with said actuating piston to move said brake shoe toward said friction disc and for limiting retraction of said actuated piston

and said brake shoe against the force of said spring means to a predetermined maximum distance, and fluid supply means contained within said cylinder for supplying additional fluid to said chamber in response to retraction of said actuating piston



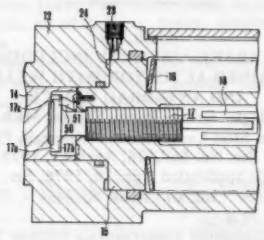
a distance greater than the predetermined maximum for said actuated piston and brake shoe to thereby accommodate the increase in volume of said chamber occasioned by the resultant separation of said pistons.

4,030,577

NEGATIVE DISC BRAKE WITH A CLEARANCE-TAKEUP MECHANISM

Yutaka Ogawa, Tokyo, and Hiroshi Hirai, Saitama, both of Japan, assignors to Akebono Brake Industry Co., Ltd. and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 8, 1975, Ser. No. 602,991
Claims priority, application Japan, Aug. 13, 1974, 49-96676
Int. Cl.² F16D *65/56*
U.S. Cl. 188—71.9 **3 Claims**



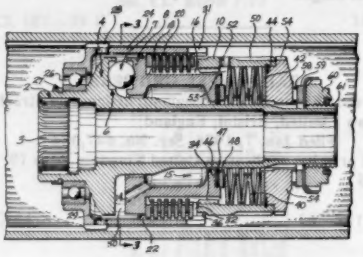
1. A negative disk brake comprising a cylinder assembly having a thrusting mechanism wherein a thrusting force of an actuating spring is normally transmitted to a thrusting piston through an actuating piston and an adjustment screw which is in screwed engagement with the actuating piston; the thrusting piston normally pushing against a rotor a first friction pad disposed on one side of the rotor; said actuating piston moving against the thrusting force of said actuating spring in the direction of taking off the brake when fluid pressure is applied; and a caliper assembly having a reaction member which pushes against the opposite side of the rotor a second friction pad disposed on the opposite side of the rotor by a reaction force resulting from the thrusting force exerted on the first friction pad to push the first friction pad against said rotor in a brake applying action of said thrusting mechanism, the negative disc brake being characterized in that the internal end of a spiral spring which exerts a turning force on said adjustment screw is drivingly coupled to the adjustment screw while the external end of the spiral spring is coupled to a lid member which is secured to a member secured to the cylinder assembly; that a cup-shaped cover is secured to the lid member; and that a resilient ring which engages with the outer circumference of said cup-shaped cover is secured to the inner circumferential end part of the cylinder assembly, said negative disc brake further comprising a spring on the actuating piston for preventing the head portion of the adjustment screw from coming into direct contact with the actuating piston.

4,030,578

TORQUE LIMITER

Michael John Cacciola, Puyallup, and Leonard Olaf Mjolsnes, Mercer Island, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 3, 1976, Ser. No. 682,829
Int. Cl.² B60T *7/12*
U.S. Cl. 188—134 **5 Claims**



1. An apparatus for limiting the amount of torque from a drive source supplied to a torque responsive element, and for locking such drive source when the drive torque is in excess of a predetermined and adjustable maximum limit, which is adapted to operate in either of two directions of rotation and automatically resets when the excessive drive torque is removed, comprising:

an input cam extending along the length of the apparatus, said cam including a flange with an input cam plate;

an output cam including an output cam plate and a spline around the outside circumference of said cam, said cam adapted to slidably mount coaxially over a portion of said input cam;

a stator rotatably secured to said input cam and encompassing said output cam and a portion of said input cam, said stator having a spline along its inside circumference, said stator being secured to a substantially rigid structure;

means for sensing excessive torque from said drive source and for slidably displacing in an axial direction said output cam with respect to said input cam;

means for axially locking said output cam to said input cam and to said stator and said rigid structure when a condition of excess torque has been reached and exceeded;

means for unlocking said output cam to said stator and said rigid structure when excessive torque has been removed; and,

means for adjusting the amount of input torque required to lock said output cam to said stator.

4,030,579

LINEAL LOCK FOR X-RAY APPARATUS

Leslie James Sell, Orangeville, Canada, assignor to Picker X-Ray Mfg. Limited, Bramalea, Canada

Filed Mar. 26, 1975, Ser. No. 562,141
Int. Cl.² B60T *13/04*
U.S. Cl. 188—171 **23 Claims**

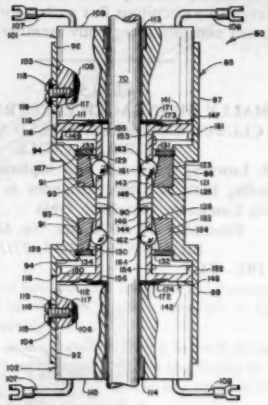
18. A lineal lock interposed between two relatively movable components of an X-ray apparatus, comprising:

a. an elongated member having a longitudinally extending surface;

b. a locking unit movable longitudinally of said member and including;

i. a housing structure;

ii. a plurality of components movably carried in said housing structure for engaging said surface; iii. wedging means interposed between said housing structure and said components for selectively wedging said components into clamping engagement with said surface;



iv. biasing means coupled to said wedging means for normally effecting such clamping engagement; and,

c. circuit means connected to the electromagnet, the circuit means being operatable momentarily to reverse the polarity of such magnetic field prior to de-energization of said electromagnet, whereby the reversed magnetic field exerts a momentary repulsion force on said wedging means to assist said biasing means in effecting clamping engagement.

4,030,580

DAMPING DEVICE FOR A VEHICLE SUSPENSION

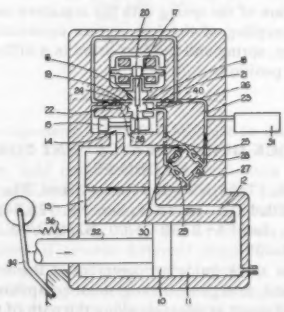
Stanley George Glaze, Brierley Hill, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Aug. 8, 1975, Ser. No. 602,998

Claims priority, application United Kingdom, Aug. 15, 1974, 35934/74

Int. Cl.² F16F 9/19, 9/34

U.S. Cl. 188—299 **3 Claims**



1. A damping device for a vehicle suspension interposed between the vehicle body and a wheel movable with respect thereto, said damping device being responsive to a damping control signal and comprising:

a fluid containing cylinder connectable to one of said vehicle body or wheel;

a piston slidable in the cylinder and connectable to the other of said vehicle body or wheel;

a pair of fluid passages having first and second ends, the first end of one of said fluid passages being in fluid communication with one end of said cylinder, the first end of the other of said fluid passages being in fluid communication with the other end of said cylinder;

a damping control valve connected to the second ends of said fluid passages and containing a movable means establishing a variable orifice in said passages which controls the rate of fluid flow between the ends of said cylinder and the damping action of said damping device;

an electrically actuatable pilot valve means operable, responsive to the damping control signal, by the pressures existing between a high pressure supply line to said pilot valve means and a low pressure discharge line from said pilot valve means for controlling said damping control valve; and

an array of non-return valves interposed between the ends of said cylinders and said supply and discharge lines for said pilot valve means and arranged to permit fluid flow only from said cylinder to said high pressure supply line and from said low pressure discharge line to said cylinder.

4,030,581

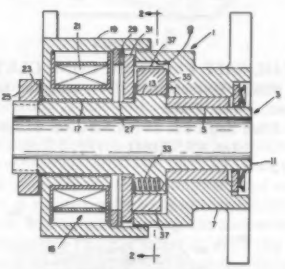
ELECTROMAGNETIC ROLLER CLUTCH

Paul F. Giometti, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Aug. 25, 1975, Ser. No. 607,165

Int. Cl.² F16D 67/06, 15/00, 27/10

U.S. Cl. 192—16 **11 Claims**



1. An electromagnetic clutch comprising:

a driving member and a driven member having opposing non-parallel surfaces;

roller members positioned between said opposing non-parallel surfaces;

means for providing relative rotation between said members when the clutch is disengaged;

electromagnetic actuating means mounted adjacent said driven and driving members, said electromagnetic actuating means comprising:

a housing core rotatably mounted to said driven member;

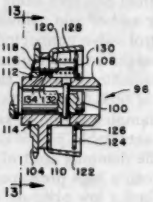
a coil fixedly mounted within said housing core, said driven member being rotatable relative to said housing core and coil when said clutch is engaged; and

an armature member mounted to said driven member, said armature member further comprising a plurality of fingers formed and arranged to move said roller members into engagement with said opposing surfaces to provide a friction drive between said driving and driven members.

4,030,582
QUICK DISCONNECT COUPLING

Robert Saul Brown, Spartanburg; Paul W. Eschenbach, Inman, and Herbert Ray King, Spartanburg, all of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 572,432, April 28, 1975, Pat. No. 3,998,075. This application Apr. 6, 1976, Ser. No. 674,112
Int. Cl.² F16D *11/00*
U.S. Cl. 192—67 P **1 Claim**

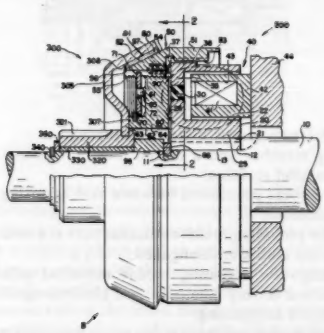


1. A quick disconnectable drive connection for a rotating shaft comprising: a cylindrical member adapted to be connected to a shaft, a sprocket member telescoped over said cylindrical member, a plurality of openings in said sprocket member, a first collar member connected to said cylindrical member adjacent said sprocket member, a plurality of openings in said first collar member, a second collar member telescoped over said cylindrical member having a plurality of pins connected thereto and projecting outwardly therefrom towards said sprocket member and spring means operably associated with said second collar member to urge said second collar member towards said first collar member to project said pins through the openings in said first collar member and said sprocket member to cause said sprocket to be capable of rotation with said first collar member, said spring means including springs around the base of said pins and bearing against a plate fixed to said cylindrical member.

4,030,583
FAIL SAFE ELECTRIC CONE CLUTCH

Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Sept. 11, 1975, Ser. No. 612,421
Int. Cl.² F16D *13/75, 27/10*
U.S. Cl. 192—84 C **7 Claims**

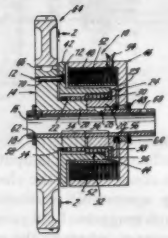


1. An electromagnetic device for transmitting torque comprising:
input means;
output means coaxially disposed with said input means;
means for driving said output means, said driving means transferring torque from said input means to said output means, said driving means further comprising:
an adjustable friction ring member;
an inner body member coaxially disposed with said friction ring member for rotational movement therewith; and
means for biasing said adjustable friction ring member into engagement with said output means;
means for electromagnetically actuating said friction device, said actuating means disposed with respect to said inner body member to form a circuitous flux path, said actuating means comprising:
a magnetic armature; and
means for adjusting said armature with respect to said inner body member; whereby when said electromagnetic means is energized a circuitous flux path is formed between said armature and said inner body member;

4,030,584
NORMALLY DISENGAGED ELECTRO-MAGNETIC SPRING CLUTCH CAPABLE OF FIELD ADJUSTMENT OF THE WRAP ANGLE

Robert D. Lowery, Willowick, and Alphonso W. Mehrbrodt, Brecksville, both of Ohio, assignors to Marquette Metal Products Company, Cleveland, Ohio

Filed May 24, 1976, Ser. No. 689,040
Int. Cl.² F16D *13/08, 27/10*
U.S. Cl. 192—84 T **11 Claims**



1. In combination with a normally disengaged electro-magnetic spring clutch having a helical spring surrounding first and second drums and in interference fit with the first drum and connected to a rotatable armature, the armature being rotationally arrested upon energization of an electro-magnetic coil to effect contraction of the helical spring into interference fit with the other of said first and second drums, an adjustment means for permitting selection of a predetermined elapsed time from energization to torque transmission comprising:
a. a lost-motion coupling means for inter-connecting the armature with said first drum to allow rotative movement of the first drum relative to the armature when the rotation of the latter is arrested to provide an engaged condition of operation; and
b. disconnection means for permitting the armature to be moved to uncouple the lost-motion means without disconnection of the spring with the armature and first drum and recoupling of the lost-motion connection with the armature, spring and the first drum in a different relative angular position.

4,030,585
BAR STOCK GUIDE ARRANGEMENT FOR SCREW MACHINES

Paul Ducanis, 17401 NW. 2nd Ave., Miami, Fla. 33169

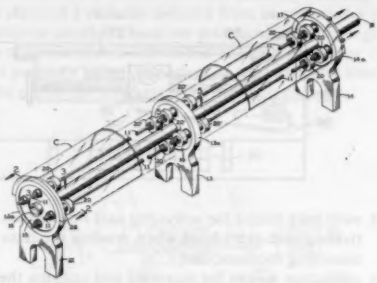
Filed Oct. 10, 1976, Ser. No. 728,546
Int. Cl.² B23B *25/00*; B23Q *3/00*
U.S. Cl. 193—38 **17 Claims**

1. In a bar stock guide arrangement at the inlet side of a screw machine, said guide arrangement comprising rigid cross plates spaced apart at intervals along the path of the bar stock at the inlet side of the screw machine and having substantially horizontal openings therethrough for passing the bar stock, the improvement which comprises:

an annular fitting defining a longitudinal passageway for the bar stock;

a plurality of guide members mounted in each fitting at circumferentially spaced locations around said longitudinal passageway for the bar stock;

spring means in each fitting resiliently biasing said guide



member inward toward said longitudinal passageway for engagement with the bar stock to restrain it against vibrating transversely; and

means rotatably mounting each fitting in each cross plate at said opening therein for permitting the fitting to rotate in unison with the bar stock when the bar stock is rotated by the screw machine.

4,030,586

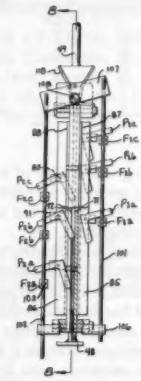
PLURAL COIN RESPONSIVE MECHANISM FOR A DISPENSING MACHINE

Elmer G. Etes, 1436 Blaisdell St., Rockford, Ill. 61103

Filed July 9, 1975, Ser. No. 594,535

Int. Cl.² G07F *5/08*

U.S. Cl. 194—59 **7 Claims**



1. A coin responsive mechanism for use in dispensing machines of the type having a coin stop for controlling a dispensing operation, said coin responsive mechanism including a generally vertical coin chute having first and second parallel sidewalls and first and second parallel end walls extending between the sidewalls with the side and end walls spaced apart to receive coins of several different denominations and to provide a gravity drop of coins to the coin stop, said first and second sidewalls respectively having first and second slots extending lengthwise thereof intermediate the end walls of the chute, said first and second slots in said first and second sidewalls being offset in opposite directions relative to a medial plane that is parallel to and equidistant from said first and second end walls whereby a portion of said second sidewall is disposed opposite said first slot and a portion of said first sidewall is disposed opposite said second slot, a first gauging pawl means mounted for movement through said first slot into said chute and having an end portion extending across said chute into engagement with said portion of said second sidewall to block upward movement of at least one preselected combination of coins in the chute, and a second gauging pawl means mounted for movement through said second slot into said chute and having an end portion extending across said chute into engagement with said portion of said first sidewall to block upward movement of at least one other combination of coins in said chute, said first and second slots each overlapping said medial plane, said first and second pawl means each having coin abutment faces on said end portions thereof that overlap said medial plane.

4,030,587

COMPUTER TERMINAL

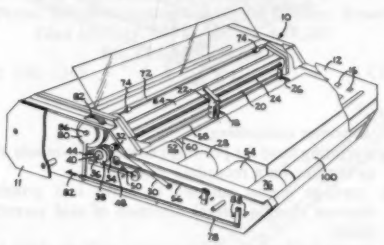
Alexander D. R. Walker, 1200 Dale Ave., Apt. 106, Mountain View, Calif. 94040

Continuation of Ser. No. 448,192, March 5, 1974, abandoned.

This application Dec. 8, 1975, Ser. No. 638,832

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **3 Claims**



1. A dot matrix printer of the kind comprising a print head assembly for printing at least one vertical column in a character having a width of a plurality of columns, a rotatable lead screw, a lead screw follower mounted on the print head assembly and selectively engageable with the lead screw for causing the print head assembly to move along the lead screw when the lead screw is rotated and the lead screw follower is engaged therewith, lead screw motor means connected with the lead screw for rotating the lead screw to drive the print head assembly across a printing surface in a printing direction away from an initial location in a sequence of movements of one full character width each, control means connected with the motor means to operate the motor means to rotate the lead screw in response to a signal supplied thereto representative of a character to be printed, return spring means connected with the print head assembly for moving the print head assembly in a reverse direction when the lead screw follower is disengaged from the lead screw to position the print head assembly at the initial location to begin a new line of printing, rotatable commutator means connected to be driven synchronously with the lead screw and in response to operation of said motor means, for generating a series of column signals only during a printing cycle indicative of individual column positions of a character each time the print head assembly is driven to move through one character-width movement in the printing direction, print head driver means operatively connected with the commutator means and the print head and responsive to said column signals from the synchronously driven commutator means for actuating the print head at a plurality of successive column positions to print a character as the print head assembly traverses one character-width movement, without interrupting such movement, and rotary detent means coupled to the lead

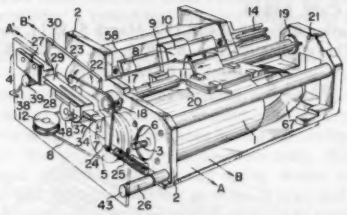
screw, actuatable between a normal condition precluding rotation of the lead screw and an actuated condition permitting rotation of the lead screw through an angular displacement corresponding to movement of the print head assembly through a single character-width movement in the printing direction; and detent actuator means responsive to an electrical signal, for actuating the detent means to its actuated condition.

4,030,588

PRINTER

Takayoshi Hanagata, Yokohama; Hideki Gushima, Kodaira, and Mitsuaki Seki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 368,534, June 11, 1973, abandoned.
This application Apr. 8, 1975, Ser. No. 566,075
Claims priority, application Japan, June 19, 1972, 47-61166
Int. Cl.² B41J *3/04*
U.S. Cl. 197—1 R **12 Claims**



1. A printer comprising:
a. a printing head for printing characters, symbols, numerals or the like on a recording medium;
b. carriage means adapted to move said printing head thereon along a lateral direction of said recording medium;
c. means for feeding said recording medium along a longitudinal direction thereof;
d. means for pressing said printing head against said recording medium;
e. means for releasing said pressing means from pressing said printing head against said recording medium;
f. a reversible stepping motor for developing a driving force to move said printing head on said carriage means and to actuate said releasing means;
g. first transmitting means for transmitting the rotational driving force of said motor to said carriage means;
h. second transmitting means for transmitting the rotational force of said motor to said releasing means; and
i. control means coupled to said stepping motor for generating first and second stepping pulses having first and second frequencies, respectively to move said printing head on said carriage means at different speeds corresponding to the pulse frequencies applied to the motor.

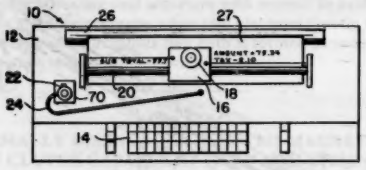
4,030,589

DATA PROCESSING MACHINE

Clarence W. Kessler, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 354,453, April 25, 1973, abandoned.
This application Jan. 12, 1976, Ser. No. 648,543
Int. Cl.² B41J *5/30*
U.S. Cl. 197—1 R **19 Claims**

1. A data reader for use with a printer having a movable print head comprising in conbination:
a. a platen for receiving a recording medium having data recorded thereon, the position of said medium being controlled by said platen;
b. a carriage having a shaft and being movable in a line direction, said shaft supporting said movable print head at times;
c. read means mounted on the carriage shaft when said movable print head is removed, for converting recorded data on said recording medium into electrical signals, and being removed from said shaft when said print head is mounted thereon;



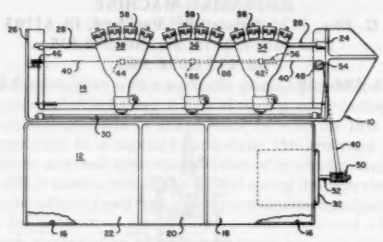
d. switching means for activating said read means and deactivating said print head when reading the data from said recording medium; and
e. utilization means for receiving and utilizing the electrical signals from said read means.

4,030,590

SPACING AND CONNECTING A PLURALITY OF PRINT HEADS

Gary A. Wojdyla, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 3, 1975, Ser. No. 619,289
Int. Cl.² B41J *3/04*
U.S. Cl. 197—1 R **2 Claims**



1. In a printer having a plurality of print heads, each print head having a bearing member secured thereto, a
drive member releasably connected to the bearing member of each of said print heads,
shaft means journaling said bearing members and supporting said print heads for travel therealong,
means for driving said print heads along said shaft means, and an elongated bar member releasably connecting the drive member of each of said print heads for spacing said heads a predetermined distance and connected at the ends of said bar member with said driving means for providing the driving means between said print heads.

4,030,591

CONTROLS FOR A MOVABLE DISK PRINTER

Blair Robertson Martin, Owego; Johann Hans Meier, Vestal, and Jerry Wesley Raider, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,803
Int. Cl.² B41J *1/32*
U.S. Cl. 197—53 **2 Claims**

1. In a printer for printing at a plurality of print positions along a print line on a document the combination of,

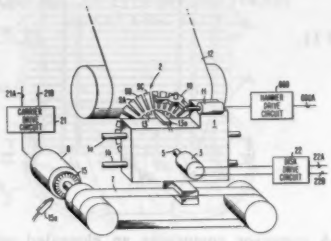
a carrier,

a carrier drive motor for moving said carrier across said print line past said print positions,

a rotatable type element mounted on said carrier,

a print hammer mounted on said carrier operable to impact said type element when a selected character is positioned at a print position,

type element drive means for intermittently rotating said type element a variable distance from one character print position to another character print position, the length of time required to move between any two particular character positions being dependent on the particular location of the particular characters on the type element,



carrier speed determining means for generating a signal which is a function of the length of time required to rotate said type element from one particular character positon to another selected character position,

carrier drive means for selectively actuating said carrier drive motor to drive said carrier past a particular print position at a selected one of a plurality of different predetermined speeds in response to said speed determining means, and

means for actuating said print hammer at a time which is dependent upon the speed of said carrier.

4,030,592

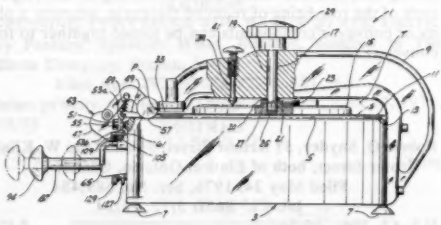
STENCIL CUTTING APPARATUS

Duncan L. Lampman, Carterville, Ill., assignor to Diagraph-Bradley Industries, Inc., Herrin, Ill.

Filed Jan. 20, 1976, Ser. No. 650,739

Int. Cl.² B41J 1/24

U.S. Cl. 197—6.4 **14 Claims**



1. Apparatus for cutting a stencil comprising:

a frame;

a type disk having a circular series of type characters on one face thereof;

means for rotatably mounting said disk relative to said frame so as to bring a selected character to a stencil cutting station;

means for pressing a stencil against said selected character at said station;

a carriage for holding a stencil to be cut with the stencil between said disk and said pressing means; and

means for moving the carriage and the stencil carried thereby comprising an axially movable plunger, a rack segment on the plunger, a pinion gear engageable by the rack segment as the plunger is moved axially, and a drive from the pinion gear to said carriage including a one-way clutch for indexing said carriage laterally with respect to said station a predetermined increment corresponding to the desired spacing between type characters of the stencil to be cut, said plunger being operably connected to said pressing means for actuation of the latter, and being movable relative to the frame from a starting position to a second position and then is movable from its second position to its starting position, said plunger effecting actuation of said pressing means as it is moved between its starting and second positions, said plunger being further movable from said starting position to a third position and thence to its said starting position for indexing said carriage said predetermined increment, said pinion gear being engageable by said rack segment as said plunger is moved from its starting position to said third position and said drive being driven by said pinion gear via said one-way clutch as said plunger is moved from its third position to its starting position thereby to move said carriage through said predetermined increment.

4,030,593

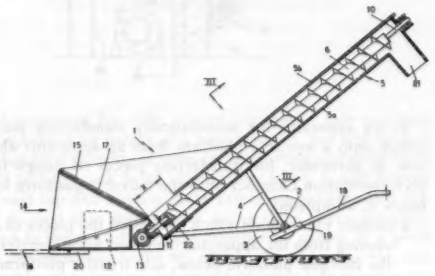
LOADING APPARATUS

Regis Pierre Deboffles, Abbecourt, 02300 Chauny, France

Filed Mar. 16, 1976, Ser. No. 667,289

Int. Cl.² B65G 47/16

U.S. Cl. 198—308 **8 Claims**



1. Apparatus for loading bulk matter by transporting the same to a higher elevation with respect to the ground comprising:

screw conveyor means for transporting bulk matter, said conveyor means having an aperture for entrance of bulk matter for conveyment thereof;

a container having a bottom portion adapted for contacting the ground to place said container in a reset position, said container receiving said conveyor means in a transverse relationship with respect to the ground when said container is placed in said rest position and having said aperture located within said container above ground level, said container forming a shovel for movement of bulk matter therein from a ground level comprising:

a. means defining a first opening in the side of said container for receiving bulk matter therethrough, said first opening disposed at ground level when said container is in said rest position; and

b. a first guide wall bridging said first opening with said aperture, said first guide wall for guiding bulk matter to said aperture from said first opening as said container is moved relative to said bulk matter; and

said container formed for providing a hopper comprising:

a. means defining a second opening in said container at an elevation higher than said aperture when said container is in said rest position; and

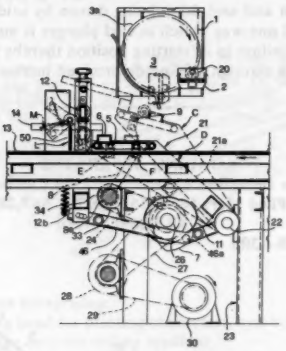
b. a second guide wall removably mounted within said container for obturating said first opening, said guide wall for aiding guiding of bulk matter to said aperture from said second opening.

4,030,594

DOUGH TRANSFER APPARATUS

Antonio Polin, Verona, Italy, assignor to Ing. Polin & C di Polin Ing. Antonio & C. S.a.s., Verona, Italy

Filed Apr. 12, 1976, Ser. No. 675,867
Claims priority, application Italy, Sept. 26, 1975, 3543/75
Int. Cl.² B65G 47/52
U.S. Cl. 198—489 3 Claims



1. An apparatus for automatically transferring pieces of dough onto a movable platform from an apparatus above it and, in particular, for transferring pieces of dough from a prefermentation chamber onto the movable platform located below it, comprising:

a transfer platform on which are rested the pieces of dough coming from the apparatus overhead to be transferred to the movable platform below, said transfer platform oscillating between an upper furthermost fixed position, below the area where the pieces of dough are discharged from the apparatus overhead, and a lower furthermost fixed position, a slight distance above the movable platform, said transfer platform comprising the upper surface of an endless belt sliding between two parallel idle drums and a crosswise support member fixed to said upper surface, parallel with said drums, said crosswise support lining up and supporting said pieces of dough, which are transferred by gravity from said overhead apparatus to said transfer platform, while said transfer platform is in the upper fixed position, in which said transfer platform is slanted, so that said piece of dough will not roll backwards because of gravity;

mechanical means for providing the transfer platform with an oscillating motion and for keeping the transfer platform locked in the said furthermost fixed positions for a predetermined amount of time; and

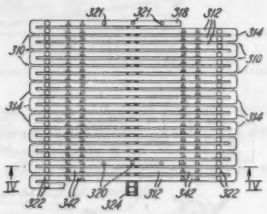
other mechanical means for causing the pieces of dough to be discharged from the transfer platform when the latter is in its lower furthermost fixed position, said other mechanical means causing the upper part of the said belt to slide alternatively in the two directions between two furthermost positions, between a first position in which the working area on the upper part of the said belt is sufficient to receive the pieces of dough, and a second position in which the said working area is outside the said upper part.

4,030,595

LATERALLY FLEXIBLE CONVEYOR CONSTRUCTION

Alan Keith McCombie, London, England, assignor to Molins Machine Company, Limited, England

Division of Ser. No. 234,833, March 15, 1972, abandoned, which is a continuation of Ser. No. 875,402, Nov. 10, 1969, abandoned. This application July 21, 1975, Ser. No. 597,434
Claims priority, application United Kingdom, Nov. 14, 1968, 54034/68; Jan. 24, 1969, 4195/69; Jan. 24, 1969, 4196/69; Feb. 14, 1969, 8313/69; Feb. 28, 1969, 10941/69
Int. Cl.² B65G 17/06
U.S. Cl. 198—778 21 Claims



1. A conveyor comprising an elongated self-supporting article support element formed by a row of laterally extending slightly spaced leg portions joined together successively at opposite sides of the support element to form a zig-zag construction embodied within a common plane, the leg portions being sufficiently long and thin to be flexible in the common plane of the support element to permit the support element to move along a laterally curved path, and being torsionally flexible to permit the support element to pass around a pulley, during which latter movement one end of each leg portion twists relative to the other end, and including a substantially inextensible, laterally flexible tension member carried by and extending along the length of the support element to withstand the tensile force applied to the conveyor during operation and to relieve the support element of any significant tensile force, said tension member being connected to said support element only at spaced points greater than the pitch of successive leg portions.

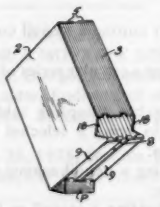
15. A conveyor component comprising a row of parallel flexible legs integrally joined alternately at opposite ends to form a zig-zag configuration, at least one leg having a downwardly extending stud portion for engaging a tension member during use, and the end portion of the leg at the respective ends of the row being of reduced thickness, whereby a plurality of conveyor components can be joined together to form a conveyor.

4,030,596

CARTONS

Robert O. Snyder, 51 Arthur Street, S., and Otto W. Klink, 26 Center Street, both of Elmira, Ontario, Canada

Filed May 24, 1976, Ser. No. 689,484
Int. Cl.² B65D 5/52, 25/24
U.S. Cl. 206—45.26 5 Claims



1. A carton having a wall structure consisting of mutually

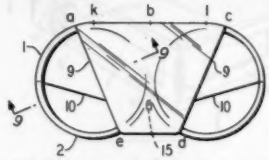
opposed side and end walls; a bottom; and a top; a removable tab defining an article dispensing aperture in a selected one of said walls adjacent said bottom and having its ends extending into the two neighbouring walls; and a pedestal cooperating with said bottom and inclining said carton from the vertical towards said aperture so that said articles are always presented by gravity to said aperture for removal therefrom, said pedestal being formed by said tab upon removal from said wall and upon said cooperation with said bottom.

4,030,597

COIN CONTAINER

Peter A. McCarthy, 106 Athens Ave., South Amboy, N.J. 08879

Filed Aug. 23, 1976, Ser. No. 716,820
Int. Cl.² A45C *11/28*
U.S. Cl. 206—.83 **11 Claims**



9. A coin container comprising:

a. a first molded section forming a first pair of parallel semi-cylindrical channels;

b. a second molded section forming a second pair of parallel semi-cylindrical channels having a diameter substantially equal to said first pair of channels;

c. first means for securing said second section to said first section wherein said first and second pairs of channels jointly define a pair of parallel cylinders;

d. second means in said first section for allowing entry of coins into said cylinders from one end thereof; and

e. third means in said first section for preventing entry and exit of coins into and out of said cylinders from the opposite end thereof;

wherein said securing means includes;

f. first and second flanged lips formed on said second section; and

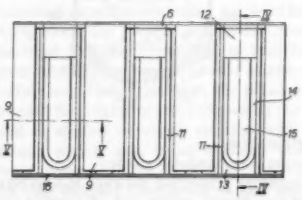
g. first and second locking lugs formed on said second and third means, respectively, for engaging said flanged lips.

4,030,598

DISPENSING CONTAINER FOR RAZOR BLADE UNITS

Harry Pentney, Spencers Wood, England, assignor to The Gillette Company, Boston, Mass.

Filed Apr. 29, 1976, Ser. No. 681,563
Claims priority, application United Kingdom, Apr. 29, 1975, 17795/75
Int. Cl.² B65D *83/10*
U.S. Cl. 206—356 **1 Claim**



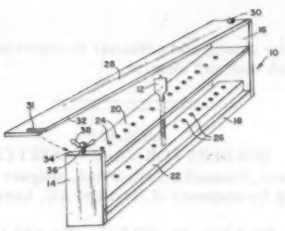
1. A molded plastic one-piece dispensing container for razor blade units having blade means permanently fixed to a head portion including guard and cap members, said container comprising a plurality of compartments arranged side-by-side for the storage of blade units, each of said compartments having opposed side walls, a rear wall, a front wall with a dispensing opening, said side walls having inturned flange portions, abutment means depending from said flange portions and extending partially across said opening, and spring means for biasing said blade units so that margins thereof are urged against an underside of said flange portions and a front edge thereof is aligned with said abutment means, said spring means comprising a leaf spring molded integrally with and extending from said rear wall and between upstanding projections which limit downward displacement of a blade unit located in said compartment, said leaf spring being displaceable by manual pressure applied to an exposed cap member of a blade unit to permit said blade unit to be depressed below the level of said depending abutment means and slid forwardly out of said container compartment.

4,030,599

SPADE BIT HOLDER

Rudolph C. Bruni, 409 Walnut St., Point Marion, Pa. 15474

Filed July 19, 1976, Ser. No. 706,260
Int. Cl.² B65D *85/20;* **A47F** *7/03*
U.S. Cl. 206—379 **5 Claims**



1. A container for drills comprising spaced side members interconnected by means of a base member, top and bottom racks having a plurality of holes for supporting said drills, each hole in said top rack being aligned over a hole in said bottom rack, said top and bottom racks extending between and fastened to said side members, a swing-away cover pivotably secured to the top of one side member by means of a pivot screw and extending to the top of the other side member, and removable cover locking means at said other side member for locking or unlocking said swing-away cover.

4,030,600

COLLAPSIBLE BULK SHIPPING CONTAINER

Harry D. Heaps, Bala Cynwyd, Pa., assignor to Connelly Containers, Inc., Bala Cynwyd, Pa.

Filed June 26, 1975, Ser. No. 590,499
Int. Cl.² B65D *19/06, 45/00*
U.S. Cl. 206—386 **16 Claims**

1. A collapsible bulk shipping container comprising:

a. a pallet,

b. a rectangular tray secured to said pallet and comprising:

i. plate means secured to the upper surface of said pallet,

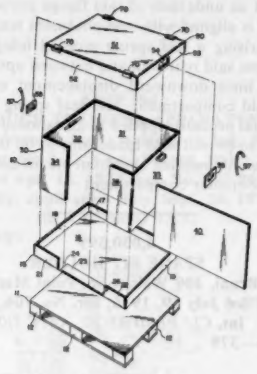
ii. upstanding peripheral wall means, and

iii. detent means overlying said plate means at spaced locations about a said upstanding wall means, said detent means comprising the edges of a flap severed from said wall means,

c. a collapsible upstanding, peripherally extending wall element within said upstanding wall means of said tray and comprising a blank scored to provide three container wall panels and a pair of partial wall panels at opposite ends of said blank, said wall element having a resiliency at the scores thereof urging said partial wall panels toward each other, said partial wall panels being adjacent said upstanding wall means having said detent means there-

along, the edges of said partial wall panels being in engagement with said detent means,

d. a closure panel extending across the space left by said partial wall panels, and



e. a top for closing said container in cooperative juxtaposition with said wall element.

4,030,601

HOLDERS FOR TAPE CASSETTES

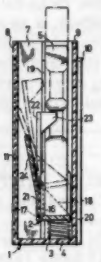
Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Lenzerheide, Switzerland

Filed May 30, 1975, Ser. No. 582,118

Claims priority, application Germany, June 5, 1974, 2427109

Int. Cl.² B65D *85/672*

U.S. Cl. 206—387 **10 Claims**



1. A holder for tape cassettes and the like, the holder comprising a housing having at least one compartment with an open front side to slidably receive a slider in the compartment, a slider in the housing and adapted to linearly transport a cassette into and out of said compartment, the slider having a cassette-engaging rear wall spaced inwardly from said open front side of the housing and the slider having an open and unobstructed front side permitting removal of the cassette from the slider by sliding movement and without tilting, stop means to limit the length of sliding movement of said slider, locking means being provided to hold the slider in its compartment against the force exerted by a spring in the housing and urging the slider into its open position, and cassette reel retention members brakingly engaging into the cassette reel apertures when said slider is locked, said retention members being pivotable in a plane perpendicular to the direction of sliding in response to and upon movement of the slider into its open position thereby disengaging from said reel apertures.

4,030,602

DEVICE FOR SEPARABLY COUPLING SECTION OF CASSETTES FOR MOTION PICTURE FILM OR THE LIKE

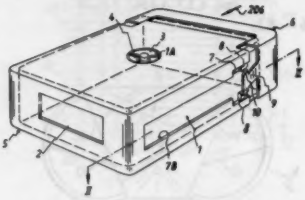
Günter Müller, and Reimund Kluge, both of Unterhaching, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Apr. 7, 1976, Ser. No. 674,592

Claims priority, application Germany, Apr. 26, 1975, 2518762

Int. Cl.² B65D *85/42, 85/672, 7/24*

U.S. Cl. 206—404 **9 Claims**



1. In a magazine, particularly in a cassette for motion picture film or the like, a housing comprising at least two discrete sections; and means for separably coupling said sections to each other, including at least one detent having a male detent member on one of said sections and a socket in the other of said sections, said detent member being movable to and from an operative position in which said detent member extends into said socket and couples said sections to each other, the depth of said socket and the thickness of said detent member being such that the entire detent member is received in said socket in said operative position thereof and the area of said socket being larger than the area of said detent member so that, when moved to said operative position, said detent member fills only a portion of said socket, the unfilled portion of said socket being accessible from the outside of said housing.

4,030,603

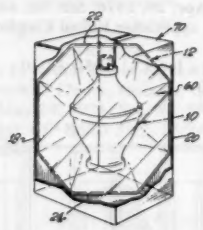
PROTECTIVE PACKAGE AND METHOD THEREFOR

Robert L. Angell, Glendora, Calif., assignor to Angell and Associates, Ontario, Calif.

Continuation of Ser. No. 370,801, June 18, 1973, abandoned. This application June 18, 1975, Ser. No. 588,088

Int. Cl.² B65D *81/02, 81/14, 65/44*

U.S. Cl. 206—521 **7 Claims**



1. In combination:

a box having a rectangular shape;

a shock-resistant protective package in said box suspending at least one fragile article out of contact with said box, said protective package neutralizing direct shock transfer to the fragile article, said protective package including:

a substantially thin continuous rod-like shock-resistant frame member completely surrounding said fragile arti-

cle, said rod being small in that cross-sectional dimension taken transverse the longitudinal axis thereof as compared to said fragile article;

means supporting said fragile article in all directions inwardly of said frame member including a wrapping of heat treat-shrunken material having at least one aperture therein for the passage of air therethrough, said wrapping tightly covering the entire perimeter of said frame member and extending inwardly therefrom into contact with said fragile article, said wrapping being in firm physical contact with said frame member and with said fragile article; and

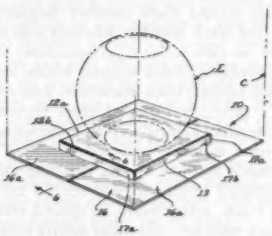
said protective package enclosed within said box, said wrapped frame member of said protective package being diagonally disposed within said box and thereby held in firm retention against diagonally opposed corners of said box whereby said wrapped fragile article is prevented from contacting the inner surfaces of said box.

4,030,604

FOLDABLE SUPPORT MEMBER AND BLANK THEREFOR

Larry R. Hildebrand, Center Valley, and John F. Carpenter, Lancaster, both of Pa., assignors to Packaging Corporation of America, Evanston, Ill.

Filed Mar. 5, 1976, Ser. No. 664,410
Int. Cl.² B65D *81/04*
U.S. Cl. 206—521 **16 Claims**



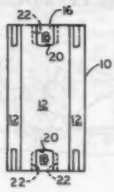
1. A support member formed of foldable sheet material for supporting an object, comprising a pair of base panels disposed in substantially coplanar relation; a pair of intermediate panels overlying said base panels and having corresponding peripheral portions foldably connected to said base panels; side wall panels foldably connected to said intermediate panels and extending angularly relative to the plane of said base panels; a top panel for engaging and subtending the object and being disposed in spaced overlying relation with respect to said intermediate panels and being foldably connected to corresponding peripheral portions of said side walls; and at least one tuck flap foldably connected to said top panel and having a first portion interposed between said intermediate panels and the plane of said base panels and frictionally held therebetween, and a second portion foldably interconnecting said first portion and said top panel and being angularly disposed relative thereto.

4,030,605

HOLDER AND DISPENSER FOR REMOVABLE JEWELRY INSERTS

Joseph J. McCarthy, 264 Broadway, Malden, Mass. 02148

Filed June 14, 1976, Ser. No. 695,782
Int. Cl.² B65D *85/54*
U.S. Cl. 206—525 **10 Claims**



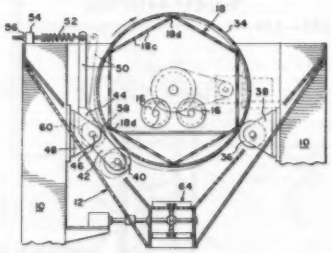
1. Holder and dispenser for removable jewelry inserts comprising a tube sufficientiy large to receive a human finger and a plurality of holding means on the exterior of said tube for releasably holding removable jewelry inserts.

4,030,606

VIBRATING TUBULAR SCREEN

Leward N. Smith, Remus, and Larry L. Morey, Mount Pleasant, both of Mich., assignors to Morbark Industries, Inc., Winn, Mich.

Filed Mar. 24, 1976, Ser. No. 669,997
Int. Cl.² B07B *1/26*
U.S. Cl. 209—287 **5 Claims**



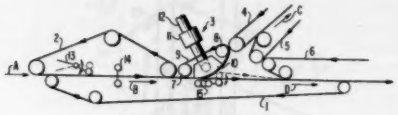
1. A vibratory screen for screening particulate material comprising a frame, an elongate tubular screen, first means on said frame supporting one end of said screen for rotation about its axis, second means on said frame cooperable with said first means to support said screen for rotation about its axis with said axis inclined to the horizontal, drive means for driving said screen in rotation about its axis, said second means engaging said screen at a location interjacent the ends thereof and including yieldable means deflectable in accordance with the weight of material in said screen, and vibratory means on said second means operable to impart a radially directed vibratory force to said screen when said yieldable means has been deflected by an amount representative of a predetermined weight of material in said screen.

4,030,607

FLAT-ARTICLE SEPARATING APPARATUS FOR AN AUTOMATIC MAIL HANDLING SYSTEM AND THE LIKE

Kazuyoshi Suda; Tomoyuki Isono; Takashi Uchida, and Kiyoshi Tsuda, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1975, Ser. No. 572,808
Claims priority, application Japan, Apr. 30, 1974, 49-48502
Int. Cl.² B07C 5/06
U.S. Cl. 209—74 R **7 Claims**



1. A flat-article separating apparatus for an automatic mail handling system, comprising:

means for feeding flat articles along an article transport path;

means installed on said transport path for sucking and transporting said flat article from said transport path on to a regular route;

means disposed upstream of said sucking means for detecting the thickness of said flat article, said thickness detecting means including first and second limit switches, said switches having first and second predetermined limits wherein at least two ranges of flat article thickness may be sensed, one where said first and second limits are exceeded and a second where said first limit is exceeded but not said second limit;

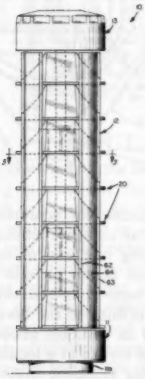
means disposed near said sucking means and responsive to said detecting means for compressing said flat article to the sucking means, and a control circuit responsive to said first and second limit switches to actuate said compressing means when said thickness detected by said detecting means is within said second range.

4,030,608

ARTICLE DISPLAY STAND

Fred Howard, New York, N.Y., assignor to Wix Corporation, Gastonia, N.C.

Filed May 5, 1976, Ser. No. 683,308
Int. Cl.² A47G 5/02
U.S. Cl. 211—131 **9 Claims**



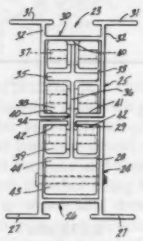
1. An upright, easily disassembled display stand comprises: a base means; a plurality of separable, stacked trays supported on the base means for rotation about a substantially vertical central axis, said trays defining a plurality of substantially horizontal article support surfaces; at least one pair of opposed, facing, spaced apart, generally vertically exending elongate channel members removably interconnected with and carried by marginal edge portions of at least two of the trays and extending therebetween and indicia bearing panels received between and removably carried by said at least one pair of channel members and extending between said at least two trays for identifying articles carried by the trays.

4,030,609

STORAGE AND DISPLAY APPARATUS EMPLOYING CANTILEVERED ROLLER TRACK

Richard E. Liebetrau, Cadillac, and Larry J. Miller, Reed City, both of Mich., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 1, 1976, Ser. No. 672,665
Int. Cl.² A47F 5/00
U.S. Cl. 211—162 **13 Claims**



1. A roller carrier useful in either the horizontal or vertical plane which comprises a generally rectangular, longitudinally extended first track member, said first track member possessing a generally H-shaped cross section defining a support section and a track section; a generally rectangular, longitudinally extended second track member of substantially identical length and cross sectional configuration to said first track member, said second track member disposed adjacent and above said first track member whereby said respective track sections are in face-to-face juxtaposition; a longitudinally extending connecting track located within and between said first and said second track members, said connecting track possessing a generally I-shaped cross section defined by a vertically extending central web member including a laterally extending base member, and roller motive means located within the track sections of said first and said second track members adapted to support said second track member and connecting track, respectively, in spaced relationship above said first track member, said roller motive means comprising a plurality of paired rollers rotatably attached in fixed position on the web member of said connecting track, said paired rollers situated in spaced-apart relationship to each other in both the longitudinal and the transverse plane whereby said rollers are in operative position to contact the respective inner surfaces of the track sections of said first and said second track members, and a plurality of single rollers located and anchored in the lowermost area of the track section of said first track member and in contact with the base member of said connecting track, said roller motive means further adapted to enable said second track member and said connecting track to reciprocate a finite distance in relation to said first track member.

7. The carrier of claim 1 wherein said carrier is employed in the horizontal plane as a lower support for a vertically extended load.

9. The carrier of claim 7 wherein said load comprises a vertically extended, planar display member, and said carrier

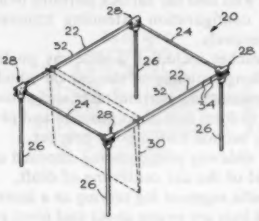
further comprises a longitudinally extending, downward projecting guide channel adapted to retain the upper horizontal edge of said display member.

4,030,610

HANGING FILE FRAME WITH RESILIENT CORNER MEMBERS

Robert L. Alexander, Erlanger, Ky., assignor to Hunt Manufacturing Co., Philadelphia, Pa.

Filed Aug. 25, 1975, Ser. No. 607,346
Int. Cl.² B42F *17/08*
U.S. Cl. 211—182 **19 Claims**



1. A hanging file folder support frame, which comprises:

a. a pair of elongate file folder support rails adapted for suspending hanging file folders from upper surfaces thereof, and

b. means for maintaining said support rails in a mutually spaced relationship and at an elevation to enable suspension of hanging file folders therefrom,

said maintaining means including a pair of transverse interconnecting members, a plurality of supporting legs and four corner fittings,

said corner fittings being formed of strong resilient material and being constructed to receive end portions of said transverse interconnecting members and upper end portions of said supporting legs, and for releasably receiving end portions of said rails, whereby a generally rectangular, rigid parallelepiped file support frame is formed with said rails at an uppor portion thereof, and

each of said corner fittings having wall portions defining an opening into which an end portion of one of the rails is installed and defining an entry into said opening for the passage of the rail into the said opening in a direction transverse to the length of the rail and the portions of the walls adjacent said entry include locking portions disposed over corresponding portions of said rail end portion when the rail end portion is installed in said opening, whereby to releasably lock the rail end portion into the opening, said locking portions being flexible sufficiently to permit entry of the rail end portion into, and removal of the rail end portion from, the opening.

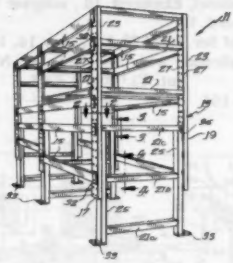
4,030,611

ADJUSTABLE STORAGE RACKS

Anthony N. Konstant, Mount Prospect, Ill., assignor to Speedrack Inc., Skokie, Ill.

Filed June 15, 1976, Ser. No. 696,301
Int. Cl.² A47F *5/10*
U.S. Cl. 211—191 **8 Claims**

1. An adjustable storage rack which comprises an end frame having front and rear columns which are interconnected with each other to achieve a fixed fore-and-aft spacing, said columns including aperture means at spaced vertical intervals for the attachment of horizontal beams having connectors for mating connection therewith, wherein the improvement comprises said columns including apertured vertical members which extend downward from the top of said end frame but which terminate a substantial distance above the floor, and also including a pair of vertical posts which extend to the floor and the upper portions of which are affixed to the inward surfaces of said apertured members to provide an overlapping



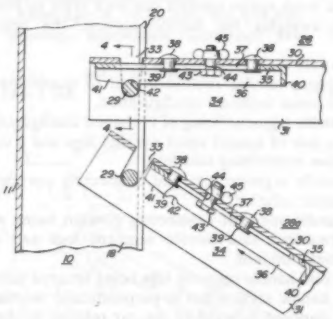
region, said posts being unapertured tubes the upper ends of which are closed, while the bottom ends of said apertured vertical members are open.

4,030,612

PALLET RACKS

Robert Gray, c/o Bay Products Division, American Metal Works, Inc., 8701 Torresdale Ave., Philadelphia, Pa. 19136

Filed June 3, 1976, Ser. No. 692,424
Int. Cl.² A47F *5/10*
U.S. Cl. 211—192 **12 Claims**



1. A rack comprising

front and rear corner uprights, parallel horizontal beams respectively connecting front uprights and parallel horizontal beams respectively connecting rear uprights,

said corner uprights have fixed horizontal members in the interiors thereof at selected locations,

struts of inverted block U-shape extending between front and rear uprights at each end, and

means for detachably connecting the ends of said struts to said fixed horizontal members,

said struts as part of said last mentioned means having slots are their ends for reception of said horizontal members, and

slidable members interiorly disposed with respect to said struts and guided by said struts for retaining said horizontal members in said slots.

4,030,613

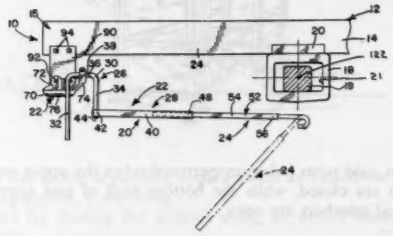
UNCOUPLING LEVER ARRANGEMENT FOR RAILROAD CARS WITH STANDARD DRAFT GEAR CUSHIONING

Osvaldo F. Chierici, Elmhurst, Ill., assignor to Holland Company, Lombard, Ill.

Continuation of Ser. No. 578,321, May 16, 1975, abandoned. This application Aug. 27, 1976, Ser. No. 718,357

Int. Cl.² B61G *3/08*

U.S. Cl. 213—166 **5 Claims**



1. In a railroad car adapted to ride on track rails and having a coupler mounted at the car centerline of draft and at one end of the car for side to side swinging movement and movement longitudinally of the car in response to buff and draft forces and including a lock lifter for uncoupling the coupler, which car is equipped for standard draft gear cushioning of said buff and draft forces and a standard striker opening, and an uncoupling device therefor including a lever assembly comprising a lock lifter section including a hook eye at one end thereof operatively engaging the lock lifter to actuate same and for support by the coupler, and a handle section including a handle segment at one end thereof pivotally secured to a body bracket mounted on the car to one side of the end of the car, which handle section has a hand grip portion to be grasped by an operator for manually operating the lever assembly to actuate the lock lifter, whereby the lever assembly is supported in its operative position between the bracket and the lock lifter and may be swung about a pivot position to move said hook eye to operate said lock lifter by the operator manually swinging the handle section, the improvement wherein:

said handle section comprises:

an elongate tubular rectilinear bar of quadrilateral transverse cross sectional configuration,

said handle segment being of U-shaped configuration defining a pair of spaced apart parallel legs and a connecting portion connecting said legs,

said handle segment legs and connecting portion being in coplanar relation,

said handle segment connecting portion being rectilinear intermediate said handle segment legs and extending normally thereof,

one of said handle segment legs being secured to one end of said handle section bar in perpendicular relation thereto and disposed inboard of the car relative to the other of said handle segment legs,

and the other of said handle segment legs projecting below said handle section bar and forming the operator hand grip portion of the handle section,

said other of said handle segment legs being spaced outboard of said one end of said handle section bar,

said lock lifter section comprising:

an elongate tubular rectilinear bar of quadrilateral transverse cross sectional configuration having the hook eye affixed to one end of same,

said handle section bar other end and said lock lifter section bar other end being in substantially coaxial adjustable telescoping torque transmitting relation, which one of said bars being received inside the other bar for supporting said other ends of said bars from the between the lock lifter and body bracket,

said bars at said other ends thereof being of substantially complemental transverse cross sectional configuration, with said bars at said other ends thereof being proportioned for free fitting of said one bar within said other bar,

said one handle segment leg being proportioned in length to dispose said bars substantially horizontally and approximately at the level of the lock lifter, with said handle segment connecting portion being substantially horizontally disposed,

with said other ends of said bars, under the action of gravity when the lever assembly is in its operating position, being canted relative to each other to dispose surface portions at both said other ends thereof in bearing engagement with surface portions of said bars that repectively oppose same, and with said bar surface portions being of substantially line configuration extending transversely of said bars, respectively,

said body bracket including a slideway portion extending generally longitudinally of the car on which said handle segment connecting portion rests and extends crosswise thereover to form said pivot position and pivotally secure the handle section to the body bracket,

said bracket slideway portion being disposed approximately at the level of the car centerline of draft,

said one handle segment leg serving as a lever arm through which said bars are swung about said pivot position by the operator grasping the hand grip portion to move said hook eye to actuate said lock lifter,

said bracket slideway portion being convexly contoured longitudinally of said handle segment connecting portion, and said handle segment connecting portion having a convexly rounded exterior surface whereby said bracket slideway portion and said hand segment connecting portion have engaging surface portions, where said handle segment portion rests on said bracket slideway portion, that approximate a point contact,

said bar surface portions having a static friction that exceeds that of said handle segment and bracket slideway engaging surface portions to provide means for making said other ends of said bars in stationary relation to said other when the lever assembly is supported in its operative relation against thrusts acting longitudinally of said bars when coupler side swing and buff and draft impacts are occasioned free of fixed connection therebetween,

whereby said lever assembly is adjustable lengthwise of said bars by manually moving said bars lengthwise thereof at said other ends of said bars to provide the operating length of the lever assembly on application of the lever assembly to its operative position, and during use, said making means holds the lever assembly to said operating length thereof when coupler side swing and buff and draft impacts are occasioned, and the lever assembly shifts as a unit sidewise of the car at said body bracket and handle segment engaging surface portions when coupler side swing and draft and buff impacts are occasioned.

4,030,614

RECIPROCAL TRANSFER APPARATUS

Yukinori Taneda, Yokohama, and Takashi Kobayashi, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 13, 1976, Ser. No. 658,066

Claims priority, application Japan, Feb. 14, 1975, 50-17932

Int. Cl.² B65G *47/91*

U.S. Cl. 214—1 BT **4 Claims**

1. A pick and place unit comprising:

a stationary frame provided thereon with a pair of plates and guide members;

a movable frame for which ends of travelling distance are defined by said pair of plates and supported slidably in a predetermined direction by the guide members;

a pair of hooks rotatably supported on said movable frame, provided with rotating force by means of springs, and adapted to engage the movable frame with the stationary

frame by engaging with said plates of the stationary frame at the ends of travel of the movable frame;

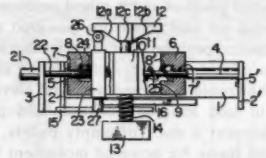
a lifting shaft supported by said movable frame slidably in the direction perpendicular to the sliding direction of said movable frame, and biased in one direction by means of a spring;

a cam fixed on one end of said lifting shaft;

a chuck for holding an article to be moved and fixed on the other end of said lifting shaft;

a driving shaft slidably extending through said movable frame in the sliding direction of said movable frame;

a driving block extending through said movable frame in the direction perpendicular to the sliding direction of said



movable frame, mounted on the movable frame through a pair of springs, slidably provided in the sliding direction of the movable frame, and fixed on said driving shaft;

a cam follower rotatably supported by one end of said driving block, engaging with said cam, and elevating or lowering said lifting shaft by the travel of the driving block;

another cam follower rotatably supported on the other end of said driving block, engaging with said hooks, and rotating said hooks by the travel of the driving block, thereby causing the movable frame and the stationary frame to be engaged or disengaged with or from each other; and

a driving device for causing said driving shaft to slide in the sliding direction of the movable frame.

4,030,615

MANIPULATOR FOR MOVEMENT OF ARTICLES IN A CONTROLLED ENVIRONMENT CHAMBER, ESPECIALLY A HIGH VACUUM CHAMBER

Diether Josef Guggi, Aachen, and Rolf Klein, Julich, both of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Germany

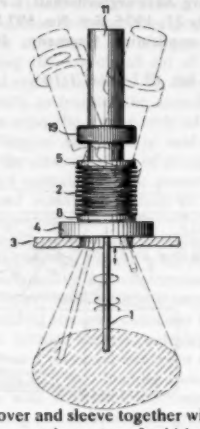
Filed Aug. 5, 1975, Ser. No. 602,148

Claims priority, application Germany, Aug. 6, 1974, 2437735

Int. Cl.² B65G *47/90*

U.S. Cl. 214—1 BB **8 Claims**

1. A manipulator for use in manipulating articles within a controlled environment chamber having a wall; a flexible bellows, a flange sealingly connected to one end of said bellows and adapted for being sealingly connected to the chamber wall, an outer cover sealingly connected to the other end of the bellows, a ball in the bellows, a ball cup stationary on the chamber and supporting said ball, a manipulator rod slidable in the ball and having one end extending into said closed cover and the other end extending into said chamber, at least one of said ball and manipulator rod being rotatable on the axis of the said rod, a sleeve in said cover coaxial with said one end of said manipulator rod having one end sealingly connected to said other end of said bellows and the other end closed, magnetic means on said one end of said manipulator rod in said sleeve, magnet means in said cover movable therein along said sleeve and magnetically coupled to said magnetic means, first means for moving said magnet means axially along said sleeve to move said manipulator rod axially, second means for rotating said magnet means on the axis of said manipulator rod for rotating the said rod, and third means



for tilting said cover and sleeve together with said manipulator rod about the geometric center of said ball.

4,030,616

DEVICE FOR THE REMOVAL OF EMPTY CONTAINERS FROM THEIR MANDRELS

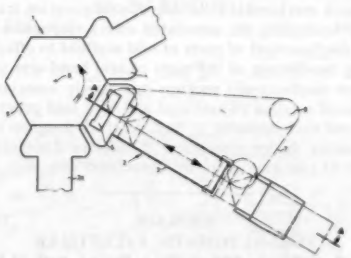
Wilhelm Vetten, Dusseldorf, Germany, assignor to Jagenberg-Werke AG, Dusseldorf, Germany

Filed Apr. 8, 1976, Ser. No. 674,997

Claims priority, application Germany, May 7, 1975, 2520504

Int. Cl.² B66C *1/66*

U.S. Cl. 214—1 BB **8 Claims**



1. In a device for stripping empty containers from a plurality of mandrels associated with a mandrel wheel and comprising a mandrel wheel, a plurality of mandrels projecting radially from said wheel, means for rotating said wheel and said mandrels, and radially displaceable means for stripping empty containers from said mandrels, the improvement which comprises supporting means carried by said wheel in association with each mandrel and of such size that upon rotation of said wheel said stripping means contacts the supporting means of the next mandrel before it ceases to contact the supporting means of the immediately preceding mandrel, whereby the stripping means is always positively supported.

4,030,617

ROBOT DEVICE

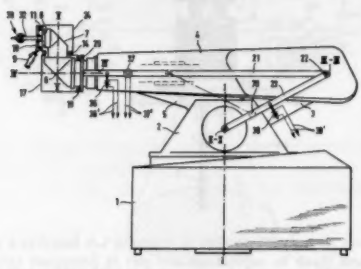
Hans Richter, Augsburg, Germany, assignor to Keller & Knappich Augsburg Zweigneiderlassung der Industrie-Werke Karlsruhe Augsburg Aktienegesellschaft, Germany

Filed July 21, 1975, Ser. No. 597,825

Claims priority, application Germany, July 22, 1974, 2435156

Int. Cl.² B66C *1/10*

U.S. Cl. 214—1 CM **20 Claims**



1. In a robot device, for the mechanical manipulation of tools or workpieces controlled by variable programs, including a multipart hand element, movable about plural axes of rotation, secured on a multipart arm element, also movable about plural axes of rotation, a programming device which can be programmed by following a program track to be covered with a programmer, and drives, respective to each axis of rotation of the hand element and the arm element, operable to displace the parts thereof about the associated axes, the improvement comprising, in combination, a manually operable multipart framework mounted on the hand-arm unit, constituted by said hand element and said arm element, to extend parallel to said unit, for limited displacement relative to said unit; a number of switches equal to the number of axes of rotation of said unit, and each respective to a single axis of rotation, operatively associated with the parts of said unit and each operable to activate and deactivate the drive respective to the associated axis of rotation; said hand element having a terminal part for mounting either a track guide or a tool adapted to follow, mechanically, said program track; at least a part of said framework being displaceable relative to said unit during such mechanical following of said program track; said switches controlling the associated drives responsive to such relative displacement of parts of said scaffold to effect corresponding movements of the parts of said hand-arm unit; and respective displacement pickups operatively associated with each axis of rotation of said unit and with said programming device, and each operable to feed the track program into said programming device responsive to relative displacement of the parts of said unit about the associated axis.

4,030,618

SEMI-AUTOMATIC PALLETIZER

Norman S. Kelley, and Florentin J. Pearne, both of Whittier, Calif., assignors to Aircraft Mechanics, Inc., Colorado Springs, Colo.

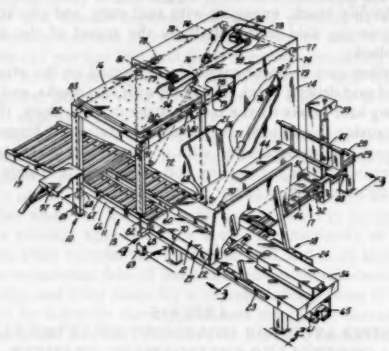
Filed May 1, 1975, Ser. No. 573,524

Int. Cl.² B65G *57/24*

U.S. Cl. 214—6 P **8 Claims**

4. A palletizer comprising a frame, an elevator supported on said frame for powered vertical movement between a lowered position and a raised position, an arranging table supported on said frame for powered movement between an extended position over said elevator and a retracted position clear of said elevator, a platform on said frame adjacent and horizontally aligned with said elevator when said elevator is in said lowered position, said platform being adapted to support a stack of empty pallets, power means for producing a lateral force on pallets for moving empty pallets onto said elevator and for removing loaded pallets from said elevator while said elevator is in said lowered position, said elevator providing anti-friction roller support means providing a substantially constant predetermined drag having a value sufficient to prevent movement of pallets supported by said elevator while said elevator is raised and lowered, said predetermined drag being sufficiently small to allow rolling movement of pallets with respect to said elevator when a predetermined lateral force is applied to such pallets.

7. A palletizer for use with pallets which can be handled by fork type handling equipment comprising a frame, an elevator supported on said frame for powered vertical movement between a lowered position and a raised position, an arranging table supported on said frame for powered movement between an extended position over said elevator and a retracted position clear of said elevator, a platform on said frame adjacent to and horizontally aligned with said elevator when said elevator is in said lowered position, said platform being adapted to support a stack of empty pallets, a pusher supported on said frame for powered movement between a rest position and an operated position, said pusher operating to push the bottom pallet in a stack of pallets from said platform

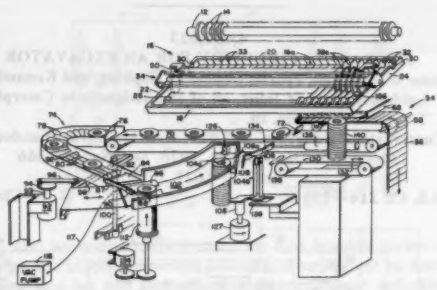


onto said elevator when said elevator is in said lowered position, and a fork lift mechanism supported on said frame for powered horizontal movement between rest position with its fork clear of said platform and an extended position with its fork over said platform, said fork lift mechanism being operable to insert its fork into the first pallet in the stack of pallets immediately above the bottom pallet in such stack, to raise said first pallet and all pallets thereabove clear of such bottom pallet, and thereafter to lower such first pallet to said platform after said pusher moves such bottom pallet to said elevator, said pusher operating to separately engage an empty pallet and a loaded pallet on said elevator and to remove said loaded pallet from said elevator while positioning an empty pallet thereon without producing contact between the loaded and empty pallets, said pusher including a first member for engaging and pushing an empty pallet, a second pusher member for engaging and pushing a loaded pallet, and a single power drive connected to operate both said first and second pusher members, said power drive including a lost motion drive allowing movement of said first pusher member without corresponding movement of said second pusher member during one portion of pusher operation and causing simultaneous movement of both of said pusher members during another portion of the pusher operation.

4,030,619
APPARATUS AND METHOD FOR STACKING ROLLS OF PRESSURE SENSITIVE TAPE

Ernest C. Hiscoe, Hudson, N.H., assignor to Nashua Corporation, Nashua, N.H.

Filed Oct. 14, 1975, Ser. No. 622,155
Int. Cl.² B65G 57/16
U.S. Cl. 214—6 M **17 Claims**



4. Apparatus for handling rolls of pressure sensitive tape that are initially carried on a mandrel in a spaced relationship, comprising, in combination,

a plurality of spaced apart, substantially parallel plates that separate the opposed faces of adjacent rolls when the mandrel is withdrawn from the rolls,

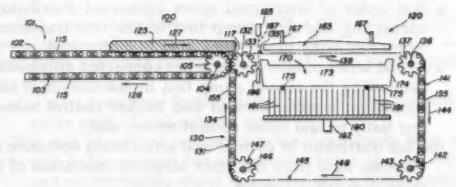
a table that supports said plates, said table having a roll feeder portion that holds a row of the rolls, and

a drop off mechanism that subtends said feeder portion and is movable between a first position in which it supports all of the rolls in said feeder portion and a second position in which it is clear of said feeder portion.

4,030,620
APPARATUS AND METHOD FOR LOADING CONTAINERS

Maynard R. Euverard, Clarendon Hills, and Henry A. Heide, Addison, both of Ill., assignors to Velten & Pulver, Inc., Chicago Ridge, Ill.

Filed Dec. 15, 1975, Ser. No. 640,728
Int. Cl.² B65G 57/16
U.S. Cl. 214—6 P **30 Claims**



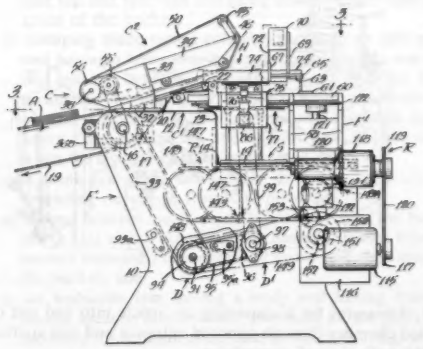
1. A loader for depositing into a container having a plurality of openings in the bottom thereof a set of grouped individual items to be maintained in a predetermined relation with respect to each other, said loader comprising a support for holding a container in a loading station, a conveyor for transporting a set of grouped individual items to the loading station and disposed above said support and in general registration therewith, a plurality of upwardly extending pins substantially greater in number than the individual items disposed beneath said support and in general registration therewith and having the upper ends thereof disposed essentially in a common surface, means for moving said pins between a receiving position wherein said pins extend through the openings in an associated container on said support with the upper ends of said pins adjacent to and immediately below said loading station and a depositing position wherein said pins are withdrawn from the openings in the associated container on said support, and means for shifting the associated set of grouped individual items at said loading station from said conveyor when said pins are in said receiving position without lateral constraint of the associated set of grouped individual items while maintaining the associated set of grouped individual items in general registration with an associated container on said support gently to transfer the associated set of grouped individual items onto the upper ends of said pins, whereby subsequent shifting of said pins to said depositing position gently deposits the associated set of grouped individual items in the associated container while preserving the individual items therein and maintaining them in the predetermined relation with respect to each other.

21. A method of loading into a container having a plurality of openings in the bottom thereof a set of grouped individual items to be maintained in a predetermined relation with respect to each other, said method comprising the steps of providing at a loading station a container having a plurality of openings in the bottom thereof, carrying a set of grouped individual items on a powered conveyor section of interconnected free rollers into said loading station overlying and in general registry with said container, moving a plurality of upwardly extending pins substantially greater in number than the individual items upwardly through the openings in the bottom of said container so that the upper ends of said pins are disposed just beneath said conveyor section, causing relative movement between the set of grouped individual items and said conveyor section to feed the set of grouped individual items off of the trailing end of said conveyor section without lateral constraint of the associated set of grouped individual items gently to transfer the set of grouped individual items onto the upper ends of said pins, and thereafter withdrawing said pins from the openings in said container gently to deposit the set of grouped individual items in said container while preserving the individual items therein and maintaining them in the predetermined relation with respect to each other.

4,030,621
COMPENSATING STACKER FOR MAGAZINES

Kermit E. Swanson, Naperville, and Frank J. Kuzel, Chicago, both of Ill., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Jan. 8, 1976, Ser. No. 647,366
Int. Cl.² B65G 57/16
U.S. Cl. 214—6.5 **14 Claims**



1. In a stacker for printed periodicals which includes a frame, drive means on the frame for driving the stacker through successive machine cycles, driven infeed means to feed a small lift of printed periodicals forwardly into the stacker on each machine cycle, a stacking station forward of

and below said infeed means to receive said lifts seriatim on top of one another, and delivery means which is operable intermittently to move stacks consisting of predetermined numbers of successive lifts seriatim out of said stacking station, an improvement consisting of apparatus for reversing the orientation of certain of said lifts so the stacks are effectively compensated, said apparatus comprising, in combination:

upper substantially horizontal lift supporting means which is positioned directly above the stacking station to receive successive lifts of periodicals from the infeed means, said upper lift supporting means being movable;

first drive means for moving said upper lift supporting means in timed relationship with the infeed means to drop each lift vertically a predetermined period of time after it is received;

lower substantially horizontal lift supporting means positioned between the upper lift supporting means and the stacking station, said lower lift supporting means being movable between a closed position and an open position;

second drive means for moving said lower lift supporting means between said positions;

lower lift support control means for actuating said second drive means in timed relationship with the infeed means to close said lower lift supporting means for receiving a lift from the first lift supporting means and to thereafter open said lower lift supporting means;

a turntable operatively associated with but independent of said lower lift supporting means to rotate lifts supported on said lower lift supporting means;

turntable drive means for rotating said turntable in 180° increments;

and turntable drive control means for operating said turntable drive means only when certain predetermined lifts in each of said predetermined number of successive lifts are on said lower lift supporting means, whereby only said certain lifts are rotated and each stack contains some lifts in a first orientation and some lifts which are turned 180° from said first orientation.

4,030,622

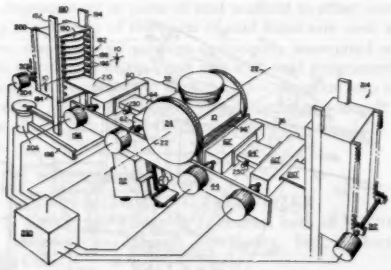
WAFER TRANSPORT SYSTEM

Norman B. Brooks, Carlisle, and Michael M. Olmstead, Bedford, both of Mass., assignors to Pass-Port Systems, Inc., Billerica, Mass.

Filed May 23, 1975, Ser. No. 580,350

Int. Cl.² C23C *13/08*

U.S. Cl. 214—17 B **21 Claims**



1. Apparatus for transporting an article into and out of a sealed chamber through opposed entrance and exit apertures in the walls thereof, comprising:

A. means defining a rigid track extending through said apertures from one side of said chamber to the other and having at least a portion thereof enclosed for isolating it from its environment,

B. environment-isolating and vibration decoupling means surrounding each of said apertures and extending from said chamber to an enclosed portion of said track to form a seal for said chamber while vibration-isolating said chamber from said track,

C. first and second valves interposed in said track on the entrance and exit sides of said chamber, respectively, for passage of articles therethrough, and

D. means for vibrating said track to advance articles on the track along the track.

4,030,623

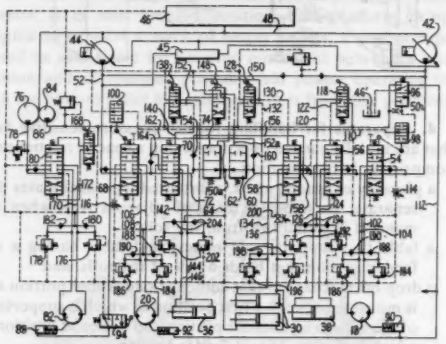
HYDRAULIC CIRCUITRY FOR AN EXCAVATOR

John W. Bridwell, Peoria; Donald L. Hopkins, and Kenneth R. Lohbauer, both of Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 207,027, Dec. 13, 1971, abandoned. This application Apr. 29, 1976, Ser. No. 681,366

Int. Cl.² E02F *3/32*

U.S. Cl. 214—138 R **17 Claims**



1. A hydraulic system for an excavator having a boom, a stick, and a bucket supported on a rotatable platform, said system comprising:

a first and a second variable displacement pump driven by an internal combustion engine;

a pair of independent translation motors;

a slew drive motor for controlling the movement of the platform;

a boom control motor;

a stick control motor;

a bucket control motor;

a first series of interrupted series connected distributors connecting said first pump first to the first translation motor and lastly to said stick control motor; and,

a second series of interrupted series connected distributors connecting the second pump first to the second of said translation motors, then to said bucket control motor, and lastly to said boom control motor; and,

the last distributor in each of said series being operative to combine fluid from the other series for operation of its respective control motor.

4,030,624

LOADER VEHICLES

Harry Matthews, Worsley, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands

Filed Dec. 31, 1975, Ser. No. 645,833

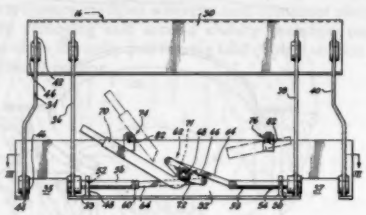
Claims priority, application United Kingdom, Jan. 4, 1975, 00352/70

Int. Cl.² E02F *3/81*

U.S. Cl. 214—145 A **9 Claims**

1. An implement coupling mechanism detachably secured to load lifting means for ready attachment and detachment of a load carrying implement comprising a bracket for supporting the implement, a selectively engageable portion thereof,

first and second members on the loading lifting means, securing means for engaging said engageable portion of said bracket to lock said bracket to said first member in a first portion of said securing means, a lug on the implement for engagement by said securing means for selectively locking the implement to said bracket and said second member in a second position of said securing means, said first member located inbetween said engageable portion of said bracket and said



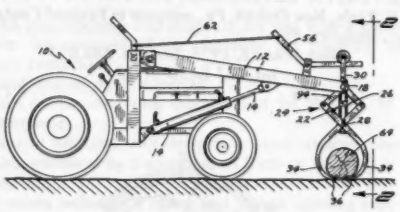
lug, said securing means located on said bracket means to permit said securing means to unlock said implement by disengaging said lug and said second member without unlocking said bracket when said securing means moves from the second to the first position, said bracket remaining engaged by said engageable portion of said bracket and said first member being engaged by said securing means, said bracket being disengageable from said lifting means by movement of said securing means to a third position.

4,030,625

LOADER ATTACHMENT FOR HANDLING LOGS, BALES AND THE LIKE

Edward L. Koehnen, Akeley, Minn. 56433

Filed Aug. 26, 1976, Ser. No. 717,949
Int. Cl.² B66C *1/62*
U.S. Cl. 214—147 G **6 Claims**



1. A loader attachment for use with a prime mover having parallel, spaced apart, power actuated, front end loader support arms extending outwardly therefrom; said loader attachment including:

a. a main horizontal frame support bar pivotally mounted in outer ends of said support arms;

b. a pair of vertical guides extending downwardly from the said frame support bar in spaced relation to each other and symmetrically about the center of the frame support bar;

c. a horizontal hook support bar extending through the vertical guides;

d. two pairs of jaw-forming hooks, each having central portions pivotally supported, one pair at each end of said hook support bar in approximate vertical alignment beneath said frame support bar;

e. a rigid link pivotally connecting an upper, outer end portion of each of said hooks with a vertically aligned portion of said frame support bar;

f. a hook support bar lifting strap intergral with and extending upwardly from said hook support bar;

g. said guides being of configuration to permit movement of said hook support bar between a first lower position wherein each of the hooks of each pair of hooks is in closed, adjacent relationship to the other hook of said pair of hooks, and a second upper position wherein said hooks are spaced at a maximum distance away from each other; and

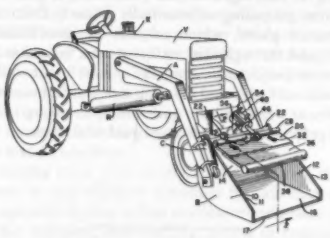
h. means for moving said hook support bar lifting strap to move said hook support bar between said first and said second positions.

4,030,626

CLAMP FOR SCOOP LOADER

Harvey Durham, P.O. Box 164, Manila, Ark. 72442

Filed May 7, 1976, Ser. No. 684,430
Int. Cl.² E02F *3/44*
U.S. Cl. 214—767 **4 Claims**



1. In a scoop loader including a material scooping bucket mounted on a vehicle which has an hydraulic system for positioning the bucket with respect to the vehicle, and the bucket having transversely spaced side walls and a rear wall, and having a bottom wall extending longitudinally in the outward directions from the rear will which joins a transversely extending top overlying an open space in the bucket above the bottom wall, a material clamping assembly comprising:

a. first bucket means attached to the top of the bucket and including brackets mutually spaced apart transversely of the bucket and carrying pivots aligned along a transverse axis, the axis of the pivots being displaced outwardly of said top and rear wall and being located above said open space of the bucket;

b. clamping blade means rotatably mounted on said pivots and having a transverse width approaching but less than the spacing between the side walls so that the blade means can be moved to a retracted position inside the bucket, the height of the blade means being such that its lower edge approaches the bottom wall of the bucket when the blade means is in retracted position;

c. a crank arm fixed with respect to the blade means and extending outwardly from said pivot axis;

d. second bracket means mounted to the top of the bucket above said axis of the pivots and having trunnion bearings located outwardly of the top and above said open space of the bucket; and

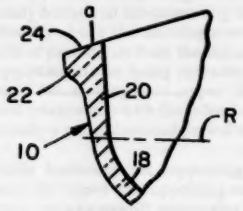
e. an hydraulic ram having a body and having trunnion means located intermediate the ends of the body and mounted for rotation about said trunnion bearings in said second bracket means, and the ram having a piston rod coupled to said crank arm and operative under the control of said hydraulic system to move the arm selectively to orient the blade means in any position between retracted position and an extended position where the blade means extends outwardly from said pivot axis.

4,030,627

TV BULB FUNNEL CONSTRUCTION

William P. Lentz, Addison, N.Y.

Filed May 10, 1976, Ser. No. 684,628
Int. Cl.² H01J 5/20, 29/00
U.S. Cl. 220—2.1 A 8 Claims



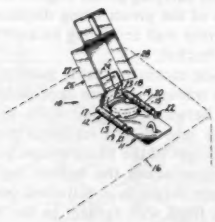
1. An improved funnel construction for use in a TV bulb which comprises, an open mouth portion having wall portions converging toward a yoke portion and a neck portion extending from said yoke portion, said funnel having an axis extending centrally through said neck portion, said wall portions terminating at said open mouth portion in a seal edge; said wall portions extending substantially linearly from an imaginary reference plane, which extends perpendicular to said funnel axis and through said wall portions, to said seal edge; a flange portion projecting outwardly of said linear wall portions adjacent said seal edge and forming a portion of said seal edge, and said linear wall portions uniformly increasing in thickness from said reference plane toward said seal edge.

4,030,628

TAMPER-PROOF CONTAINER CAP COVER

Lawrence Hippert, Jr., Rte. No. 3, New Ulm, Minn. 56073

Filed Aug. 16, 1976, Ser. No. 714,769
Int. Cl.² B65D 25/00, 54/14, 43/16
U.S. Cl. 220—85 P 7 Claims



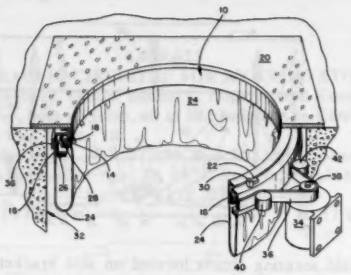
1. A tamper-proof two-piece cover for caps on container spouts comprising:
   a. a first collar;
   b. a second collar;
   c. means for detachably mounting said collars together about the spout of the container; enclosure means for completely enclosing said mounting means and the cap on the spout;
   d. a hinge pivotably connecting said enclosure means to said second collar; and
   e. latch means for securing said enclosure means to said first collar whereby said mounting means and cap are completely enclosed and inaccessible.

4,030,629

FLEXIBLE HATCH COVER

Igor V. Melnikov, East Brunswick, N.J., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed June 28, 1976, Ser. No. 700,458
Int. Cl.² B65D 55/00
U.S. Cl. 220—211 5 Claims



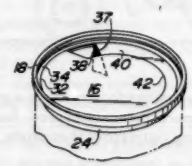
1. A flexible hatch cover comprising,
   a container having an opening,
   a rim about the circumference of said opening,
   a second rim about the circumference of said opening and movable in a rotary manner with respect to said first rim,
   a flexible sleeve having one end attached around the circumference of said first rim and the other end attached around the circumference of said second rim and a length sufficient to at least substantially close the opening, and
   means for rotating said second rim with respect to said first rim.

4,030,630

ALL PLASTIC RECLOSABLE CONTAINER CLOSURE

Carl F. Yealy, New Oxford, Pa., assignor to Penland Container, Inc., Hanover, Pa.

Filed June 18, 1975, Ser. No. 588,097
Int. Cl.² B65D 51/22
U.S. Cl. 220—258 6 Claims



1. An all plastic reclosable container closure comprising first and second plastic closure members, said first member being comprised of a thermoplastic material and having a flat substantially disc shaped central section and a peripheral portion integrally connected to and substantially surrounding said central section, part of said peripheral portion being adapted to be fixedly secured to a container to cover an opening in said container, said central section being connected to said peripheral portion by a first thin plastic portion which completely surrounds said central section, the thickness of said thin plastic portion being substantially less than the thickness of either said central section or said peripheral portion whereby said central section can be torn from said peripheral portion, part of said central section being composed of a tab element connected to the remaining part of said central section by a second thin plastic portion which completely surrounds said tab element, the thickness of said second thin plastic portion being substantially less than the thickness of

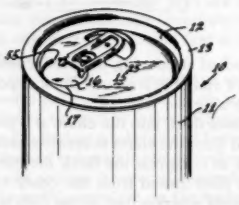
said central section, said central section being further composed of a partial spiral portion one end of which is located adjacent said tab element whereby said central section can be torn from said peripheral portion by pushing said tab element inwardly and lifting the said one end of said partial spiral section, said entire central section including said tab element lying substantially in a single plane, said second closure member being adapted to cover said central section and being adapted to be releasably connected to the peripheral portion of said first closure member whereby said container closure is opened by removing said second closure member, pushing said tab portion inwardly and tearing said central section from said peripheral portion.

4,030,631

EASY-OPEN ECOLOGY END

Omar L. Brown, Dayton, Ohio, assignor to Ermal C. Fraze, Dayton, Ohio

Filed Aug. 27, 1975, Ser. No. 608,044
Int. Cl.² B65D *41/32*
U.S. Cl. 220—269 **26 Claims**



1. An easy-opening end structure for use with a container wherein the contents of the container are normally under pressure comprising:

an end wall of sheet material;

means cooperating with the end wall for attachment to a container;

means in said end wall defining a panel at least partially circumscribed by a scoreline to form an opening in said end wall;

tab means including a lifting end and an opening end;

said opening end of said tab including depending finger means operative to bear against said panel in an opening sequence,

means to affix said tab means to said end wall such that the opening end thereof overlies said panel whereby the tab remains affixed to said end wall after formation of said opening;

means integral with the end wall to secure said panel to said end wall subsequent to rupture of said scoreline;

said means to secure said panel being located laterally of said affixing means;

said scoreline including a portion located between the opening end of the tab and said affixing means;

said tab being a longitudinally rigid lever operative in response to raising the lifting end thereof to cause the opening end of the tab to bear against said panel and to initiate rupture of the portion of the scoreline located between the opening end of the tab and the affixing means by a class **2** lever action; and

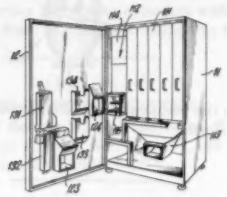
said tab being operative as a class **1** lever subsequent to the initial rupture of said portion of said scoreline to effect rupture of the remainder of said scoreline progressively from said portion of the scoreline towards said means to secure said panel and to urge said panel downwardly and laterally during the progressive rupture of said scoreline.

4,030,632

FOOD VENDING MACHINE WITH COOKING APPARATUS

Ikuo Harashima, Tsesaki, Japan, assignor to Sankyo Electric Company, Limited, Isesaki, Japan

Filed May 28, 1976, Ser. No. 690,923
Claims priority, application Japan, May 29, 1975, 50-71330[U]; Sept. 8, 1975, 50-109175; Oct. 3, 1975, 50-136173[U]; Dec. 1, 1975, 50-162343[U]; Dec. 10, 1975, 50-167078[U]
Int. Cl.² G07F *9/10*
U.S. Cl. 221—150 A **18 Claims**



1. In vending apparatus for dispensing foods having a vending control circuit which generates a vending signal when said foods are sold and a cooking apparatus for cooking the foods sold said cooking apparatus including a cooking chamber having a door to provide access to the chamber, a cooking device and manually operated switch means for activating the cooking device, an improvement comprising:

locking means for locking the door of the cooking chamber in a closed condition;

first detecting means for detecting said vending signal;

first timer means which is activated by said first detection means to operate during a first predetermined time period;

means for releasing said locking means in response to an output from said first timer means;

a second timer means connected to said output of said first timer means through said manually operated switch means, said second timer means being activated in response to the operation of said manually operated switch means during said first predetermined time period when said first timer means is in operation, and operating during a second predetermined time period, which is shorter than said first predetermined time period; and

said cooking device being connected to the output from said second timer to be operated during said second predetermined time period.

4,030,633

SYSTEM FOR CONTROLLING SEGREGATION WITHIN A BIN DURING MATERIAL WITHDRAWAL

Glen W. Fisher, Seattle, Wash., assignor to Technovators, Inc., Seattle, Wash.

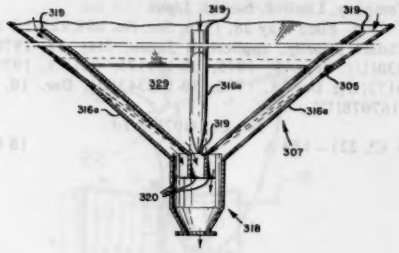
Continuation of Ser. No. 449,055, March 7, 1974, abandoned, which is a continuation of Ser. No. 354,173, April 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 254,883, May 19, 1972, abandoned. This application Aug. 29, 1975, Ser. No. 609,801
Int. Cl.² B65G *65/30*
U.S. Cl. 222—1 **23 Claims**

21. A method of withdrawing particulate material from a bin having a hoppered bottom, comprising the steps of:

controlling downward flow of particulate material through the bin by withdrawing particulate material from the bin at a plurality of points located solely in the bin bottom to form a plurality of discharge streams drawn from respective portions of a horizontal bin cross sectional plane;

combining the discharge streams into a composite output stream under uniform flow conditions without cross flow

therebetween in proportion to the areas of said bin cross sectional plane from which they are respectively drawn,



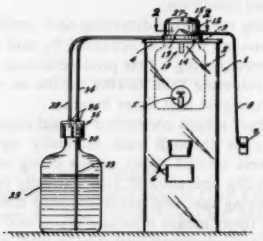
whereby the composition of the output stream is substantially uniform.

4,030,634

BOTTLED WATER TRANSFER DEVICE

David R. Osborn, 30695 Calle Chueca, San Juan Capistrano, Calif. 92675

Filed Mar. 16, 1976, Ser. No. 667,421
Int. Cl.² B67D *5/54*
U.S. Cl. 222—23 7 Claims



1. Water transfer apparatus adapted for use in combination with a bottled potable water dispenser apparatus on a support surface having an exteriorly exposed olla having an upwardly disposed opening substantially above the support surface and wherein the olla is adapted for normal reception of an inverted bottle of potable water for filling the olla for valved dispensing of the potable water from the olla comprising:

a. olla closure means for substantially closing the upper opening of the olla and including a non-siphon water conduit passing therethrough for communication with the interior of the olla;

b. a closure adapted for sealing engagement with an open neck of a bottle of potable water, at a level substantially below the opening of the olla, and including a pressurized gaseous fluid inlet conduit for communication with the headspace of the bottle and an eduction tube for withdrawing water from the bottle;

c. motor operated gaseous fluid pressure generating means carried by said olla closure and operatively connected to the inlet conduit of the bottle for pressurizing the headspace of the bottle for pressure delivery of water from the bottle to the interior of the olla through a conduit communicating the eduction tube and the non-siphon water conduit; and

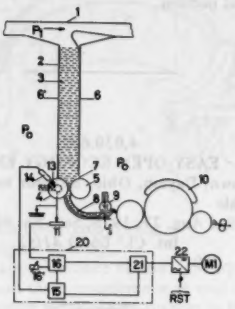
d. means carried by said olla closure and responsive to water level in the olla for controlling delivery of water to the olla in response to pressurization of the headspace of the bottle.

4,030,635

METHOD AND APPARATUS FOR PRODUCING A CONTINUOUS EVEN STRAND OF FIBERS

Kurt Hablützel, Wiesendangen, and Hansruedi Lamparter, Winterthur, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Dec. 4, 1973, Ser. No. 421,688
Claims priority, application Switzerland, Dec. 5, 1972, 17649/72
Int. Cl.² D01G *15/40*
U.S. Cl. 222—55 12 Claims



1. A method of producing an even continuous strand of fibers at an exit end of at least one flock depositing chute, said method comprising the steps of

delivering fiber flock into the chute at a preset air pressure;

removing air from the chute to create a pressure drop within the chute to compress the flock therein;

removing a fiber strand from the chute between a pair of take-off rolls wherein one of the rolls is a sensing roll;

measuring the density of the fiber strand removed from the chute;

comparing the measured density of the fiber strand with a present value to obtain a difference value;

initiating and completing an integration of the obtained difference values in a period of time equal to a single revolution of the sensing roll; and

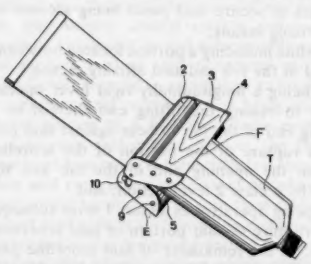
varying said pressure drop as a function of the integrated difference values to maintain an even continuous strand.

4,030,636

TUBE SQUEEZING DEVICE

Claude Drancourt, Grenoble, France, assignor to Societe Presstub, France

Filed Mar. 15, 1976, Ser. No. 666,979
Claims priority, application France, Mar. 14, 1975, 75.08645
Int. Cl.² B65D *35/28*
U.S. Cl. 222—102 7 Claims



1. A tube squeezing device for use in manually emptying

deformable tubes of the type containing soft paste, comprising:

an upper jaw, including a first, generally horizontal transverse plate engageable by the fingers and having generally vertical, rearwardly extending first end plates on the opposite ends thereof;

a lower jaw, including a second, generally horizontal transverse plate also engageable by the fingers and having generally vertical, rearwardly extending second end plates on the opposite ends thereof, the outer ends of said second end plates each having upwardly extending portions thereon arranged to mesh with the outer ends of said first end plates;

a rotatably mounted first shaft connecting the meshed portions of said first and said second end plates for pivotally connecting said upper and said lower jaws, with said first and said second transverse plates in opposed relationship, the outer ends of said second end plates having aligned apertures therein beneath said first shaft;

a second shaft having its opposite ends received within said aligned apertures;

a first squeezing cylinder received on said rotatable first shaft;

a second squeezing cylinder rotatably carried by said second shaft, and disposed generally below said first squeezing cylinder in opposed relationship;

The space between said upper and said lower jaws being open and unobstructed when said jaws are pivoted apart whereby a tube can be inserted therebetween, with the end thereof in engagement with said first and said second squeezing cylinders; and

means operable upon pivotal movement of said upper and lower jaws toward each other to positively rotate said first squeezing cylinder, to thereby laminate between said first and said second cylinders a tube placed between said jaws with the end thereof inserted between said cylinders, said opposed first and second transverse plates being engageable with and exerting pressure on the body of said tube during such pivotal movement of said jaws to thereby squeeze said soft paste out of the tube.

4,030,637

APPARATUS FOR DOSING AND MIXING FLUID REACTANTS

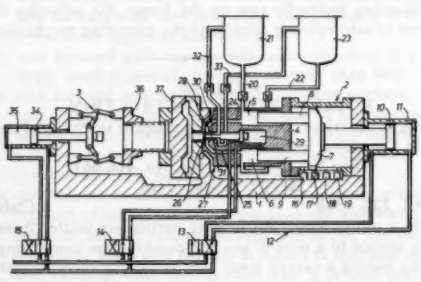
Heinrich Boden, Leverkusen, and Ulrich Knipp, Schildgen-Nittum, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 9, 1976, Ser. No. 656,234

Claims priority, application Germany, Mar. 12, 1975, 2507727

Int. Cl.² B65D *5/52*

U.S. Cl. 222—137 **4 Claims**



1. Apparatus for dosing and mixing at least two fluid reactants, comprising

a. a dosing unit comprising a housing containing dosing cylinders arranged side by side which are connected to storage containers for the reactants through pipes, and a yoke on which dosing pistons corresponding to the cylinders are arranged and which is provided with a drive, and

b. a mixing head with mixing chamber and outlet aperture, said mixing chamber containing an ejection control member comprising a piston adapted to traverse the mixing chamber so that in a first position said ejection control member allows the reaction components to enter said mixing chamber and in a second position said ejection control member allows the reactants to return to said storage containers, and

c. conduits connecting the dosing unit to the mixing head characterized in that the housing of the dosing unit and the mixing head together form a rigid block with the conduits connecting the dosing cylinders with the mixing chamber in the form of channels inside this block.

4,030,638

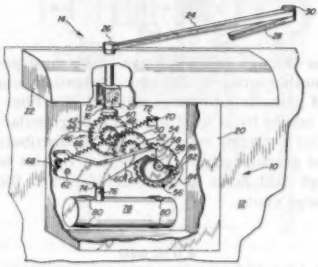
FLUID DISPENSER SYSTEM

Joseph P. Lanno, 20 Beacon St., Newton, Mass. 02167

Filed June 1, 1976, Ser. No. 691,386

Int. Cl.² B05B *12/02*

U.S. Cl. 222—180 **2 Claims**



1. A periodically activated fluid dispenser system, driven by a door-closer unit having an output shaft driven by motion of an associated door, comprising: a fluid dispenser container; a cam member; a follower member, responsive to said cam member, for activating said fluid dispenser container to dispense fluid at least once during each rotation of said cam member; an input drive member driven by said output shaft; a ratchet mechanism responsive to said input drive member for producing unidirectional rotary motion; and a gear train mechanism responsive to said unidirectional rotary motion output from said ratchet mechanism to drive said cam member through only a portion of a full rotation upon each operation of the output shaft.

4,030,639

CHARCOAL ADSORBER FILTER FILL SYSTEM

Harold Cheney Parish, Upper Arlington; Michael Duane Allard, Columbus; Jack Leland Pettit, Columbus, and Ivars Sigurds Spulgis, Columbus, all of Ohio, assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 28, 1975, Ser. No. 572,580

Int. Cl.² B65D *47/08;* **B67D** *5/08*

U.S. Cl. 222—189 **12 Claims**

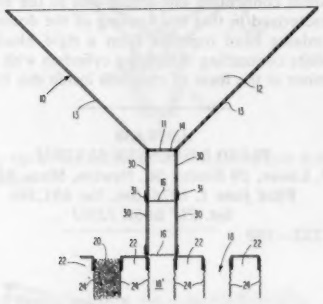
1. Apparatus for filling filter cells with granular adsorbent material from above the cells to obtain uniform density in the cells, comprising:

a. a horizontally elongated hopper for containing granular adsorbent material, said hopper including a metering plate extending longitudinally substantially the length of said hopper and forming a portion of the bottom of said hopper, said metering plate having a first plurality of holes therein for flow therethrough of granular adsorbent material downward out of said hopper;

b. a pair of side walls, each wall extending downward from

said bottom of said hopper from a position outboard said metering plate, said pair of side walls thereby forming a downwardly extending discharge chute; and

c. A plurality of rigid distribution meshes, each mesh substantially parallel to and the same area as said metering plate and rigidly secured to both side walls of said pair, within said discharge chute, said meshes disposed one above another so granular adsorbent material exiting said



hopper through said discharge chute must pass through said meshes seriatim; whereby substantially uniform density of granular adsorbent material in a filter cell being filled results by at least a portion of granular adsorbent material impinging at least one of said distribution meshes as said granular adsorbent material vacates said hopper through said holes and flows downward through said discharge chute.

4,030,640

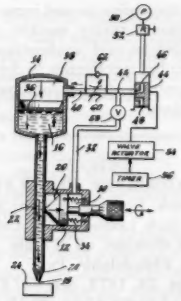
METHOD AND APPARATUS FOR DISPENSING VISCOUS MATERIALS

Paul S. Citrin, Danbury, and Frank Gurski, Brookfield, both of Conn., assignors to Indicon Inc., Danbury, Conn.

Filed Nov. 10, 1975, Ser. No. 630,278

Int. Cl.² B65D *37/00*

U.S. Cl. 222—207 **13 Claims**



1. In a high viscosity material dispenser having a discharge port in material flow communication with a deformable tube coupled to receive material from a reservoir from where the high viscosity material is obtained for dispensing with a normally open pinch valve operatively located between the discharge port and the reservior to deform the tube for the discharge of material, the improvement comprising

first means for simultaneously pressurizing the material in the reservoir and closing the pinch valve to deform the tube against pressurized material and reduce the volume of the tube for the dispensation of a desired amount of high viscosity material contained in the segment of the tube located between the pinch valve and the discharge port, and second means for simultaneously reducing pressurization of the material in the reservoir and opening the pinch valve to enable the tube to increase its volume for a suck-back of the material at the discharge port and a crisp cut-off from dispensed material.

4,030,641

IMPLEMENTS FOR DELIVERING PARTICULATE MATERIAL TO THE GROUND

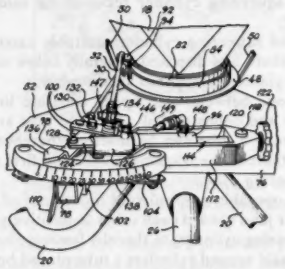
Alfred J. Bailey, Berkswell, and Malcolm Dean, Green Lane, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed July 11, 1975, Ser. No. 595,208

Claims priority, application United Kingdom, Aug. 7, 1974, 34756/74

Int. Cl.² A01C *17/00*; **E01C** *19/20*; **F01B** *31/00*

U.S. Cl. 222—317 **3 Claims**



1. An implement for spreading particulate material on the ground comprising a frame, a hopper mounted on the frame for the particulate material, a spreading mechanism mounted on the frame below the hopper, and a metering mechanism supported on the frame to control the rate of passage of the particulate material from the hopper to the spreading mechanism, the metering mechanism comprising metering members in face-to-face contact defining at least one opening for the passage of particulate material from the hopper to the spreading mechanism, the metering members being supported on the frame for pivotal movement about a generally vertical axis and movable relative to each other to infinitely vary the size of said opening from closed to fully open, a double-acting hydraulic ram operably connected to the metering members to position the metering members relative to each other, a setting indicator to indicate the position of the metering members relative to each other and adjustable mounting means mounting the double-acting hydraulic ram on the frame, for adjusting the position of said opening relative to the spreading mechanism.

4,030,642

ROTARY FEEDER CONSTRUCTION

Charles B. Morrison, Oregon, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1973, Ser. No. 416,061

Int. Cl.² G01F *11/24*

U.S. Cl. 222—368 **6 Claims**

1. In a rotary feeder for feeding particulate matter from a supply source to a zone of use, the combination comprising a housing having a curved inner wall surface, a valve rotatably mounted in said housing and having a central shaft and a plurality of vanes having material engaging surfaces radially extending from said shaft, first alternate imperforate vanes having edges in close proximity to said housing inner wall surface whereby said first alternate vanes rotate with substantially no clearance between said vanes and the housing inner wall surface, second alternate vanes defining clearances, at

least in part, through which gases may pass in the normal course of valve rotation; said housing being in communication with a particulate material inlet and a particulate material

outlet whereby rotation of said rotary valve will sweep particulate matter from said inlet to said outlet over said housing inner wall surface.

4,030,643

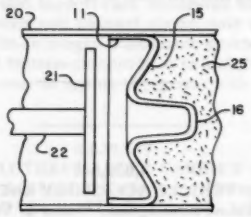
CONTENTS-CONSERVING PLUNGER FOR CARTRIDGE

Dick T. van Manen, Canandaigua, N.Y., assignor to Voplex Corporation, Pittsford, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,619

Int. Cl.² B67D 5/42

U.S. Cl. 222—386 **6 Claims**



1. A plunger for a cartridge having an open rear end and a dispensing nozzle at a forward end, said plunger comprising relative to said cartride:

a. an annular wall for engaging the inside of said cartridge;

b. a flexible forward wall integral with the forwardmost region of said annular wall and movable between forward and rearward positions;

c. said forwardmost region of said annular wall curving into said forward wall in a relatively small radius of curvature of more than 90°;

d. a projection extending forward from the central region of said forward wall, said projection being shaped to fit into a rearward region of said nozzle;

e. said forward wall curving into said projection in a relatively small radius of curvature of more than 90°;

f. said forward wall being in said rearward position when said plunger is seated in said rear end of said cartridge;

g. said projection extending forward of a plane intersecting said forwardmost region of said annular wall when said forward wall is in said rearward position;

h. the volume of the portion of said projection extending forward of said plane being less than the volume of said contents around said projection in a space rearward of said plane when said plunger is seated in said rear end of said cartridge and said forward wall is in said rearward position;

i. said forward wall of said plunger being movable forward to said plane to dispense said volume of said contents around said projection when said forward wall is forced against said forward end of said cartridge; and

j. said forward movement of said forward wall being arranged to force substantially all of said projection into said rearward region of said nozzle for dispensing most of said contents from said rearward region of said nozzle.

4,030,644

NON-RETURN SAFETY VALVE ASSEMBLY AND PRESSURE PACK INCORPORATING SAME

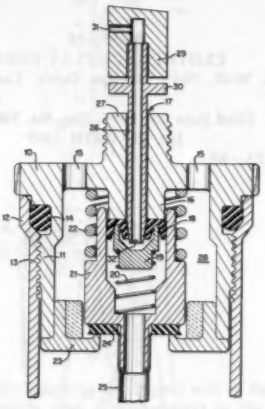
John Joseph Creighton, 100 Park Road, East Hills, New South Wales, Australia (2213)

Filed May 21, 1976, Ser. No. 688,677

Claims priority, application Australia, Feb. 26, 1976, 11473/76

Int. Cl.² B65D 8/14

U.S. Cl. 222—396 **10 Claims**



1. A valve assembly for use in a container for dispensing fluids under the influence of pressure within the container comprising

a. an outer valve casing having screw threads thereon to cooperate with screw threads on the container to couple the two together in conjunction with a sealing ring to provide an air-tight but releasable connection,

b. relief holes on the top of the casing to allow the escape of excess propellant pressure or liquid,

c. a centrally and axially located upstanding neck on the outer valve casing,

d. an internally extending locating flange on the under side of the outer valve casing, and coaxial with said axially located neck,

e. a bore passing through the axially located neck and the internally extending locating flange,

f. a cylindrical inner valve casing having an internal axial bore which is a sliding outer fit around said locating flange,

g. an annular valve insert supported below the inner valve casing by the outer valve casing and said annular valve insert capable of bearing against the bottom of said inner valve casing to form a gas and liquid-tight seal,

h. an inverted-U cross-section ring gasket mounted coaxially on the lower face of the locating flange, the outer edge of said ring gasket bearing against the periphery of the internal axial bore of the cylindrical inner valve casing to form a gas and liquid-tight seal between said inner valve casing and the said internally extending locating flange,

i. a dip-tube extending into the internal axial bore of the cylindrical inner valve casing down through the annular valve insert into the container,

j. a valve stopper with an annular upstanding wall which seats in the inverted-U ring gasket,

k. a spring inserted between the base of the axial bore of the inner valve casing and the valve stopper to urge the latter

into contact with the inverted-U ring gasket to form a gas and liquid-tight seal, and

l. an actuator discharge tube which passes down the bore through the neck of the outer valve casing sufficiently far to be able to bear upon the spring-urged valve stopper and depress it to break the seal when said actuator tube is pressed,

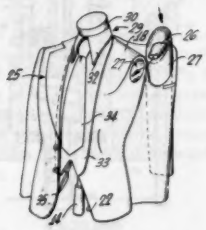
said actuator discharge tube sliding through the inverted-U ring gasket to form a seal with the exterior surface of the actuator discharge tube and said actuator discharge tube having gaps in the periphery of its lower edge to allow the contents of the container to escape.

4,030,645

CLOTHING DISPLAY FORM

Morris A. Wolf, 7048 Macapa Drive, Los Angeles, Calif. 90068

Filed June 28, 1976, Ser. No. 700,469
Int. Cl.² A41H 5/00
U.S. Cl. 223—68 **11 Claims**



1. A clothing display form for a sleeved garment such as a sport coat, comprising:

a torso-shaped section simulating the upper portion of a human body, including the shoulders thereof;

two elongated arm sections composed of relatively rigid and smooth-surfaced material shaped to substantially fill the sleeves of the garment and having a preselected shape for holding the sleeves in the same shape, said arm sections having upper end portions positionable alongside the shoulder-simulating portions of the torso-shaped section;

said torso-shaped section having two generally circular socket openings in its opposite sides immediately below the shoulder-simulating portions thereof, and having annular flanges extending inwardly from said socket openings and inclined downwardly therefrom into the torso-shaped section;

and a stud on each of said arm sections positioned to project laterally from the side adjacent said torso-shaped section into the socket opening, said studs being spaced below the upper ends of said arm sections to position said upper ends relative to the shoulder-simulating portions, and being inclined downwardly and inwardly at an angle corresponding to the incline of said flanges, and the undersides of the studs being curved surfaces cooperating with the flanges to position the arm sections in preselected positions relative to the torso-shaped section as an incident to the engagement of the studs and the flanges;

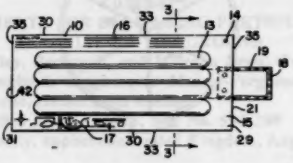
said socket openings being substantially larger in area than the cross-sectional area of said studs to permit rapid positioning of the arm sections in the sleeves of a garment and alongside the torso section with the studs inserted in the socket openings, and to gravitate into correct positions relative to the torso section, and also to permit free swinging of the arm sections relative to the torso section while in a sleeved garment, whereby the garment can be quickly arranged on the form.

4,030,646

SURVIVAL BELT/BAG

John Switack, and Elva Jane Switack, both of 11 Los Altos Square, Los Altos, Calif. 94022

Filed Jan. 20, 1975, Ser. No. 542,193
Int. Cl.² A45F 3/00
U.S. Cl. 224—9 **1 Claim**



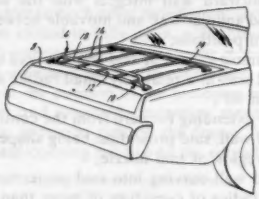
1. A survival belt/bag adapted to be worn about the waist as a belt or for enclosing a substantial portion of the body when as a bag, comprising impervious flexible, resilient, two-ply inflatable sheet material, foldable longitudinally on spaced fold lines of belt size dimensions, for wearing in the folded condition as a belt, plural air chambers between said fold lines, which may be inflated when unfolded to convert the belt to the bag, wherein it may be worn about the body providing insulation against the elements, and a belt-buckle container for attaching the ends of the folded belt/bag together about a person's waist, said container adapted to carry survival items.

4,030,647

VEHICLE ACCESSORY RACK

William A. Rasor, Birmingham; Walter S. Van Dine, Lexington, and Frank A. Whitney, Algonac, all of Mich., assignors to Masco Corporation, Taylor, Mich.

Filed May 22, 1975, Ser. No. 579,928
Int. Cl.² B60R 9/06
U.S. Cl. 224—29 R **2 Claims**

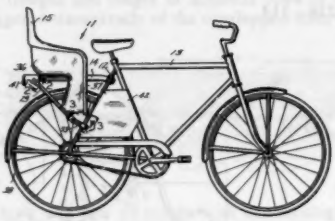


1. A rack adapted to be secured to the outer surface of a motor vehicle, said rack comprising a generally rectangular frame, a plurality of convex joint members extending from said frame, a plurality of socket members, each of said socket members being resiliently deformable and receiving one of said convex members in a snap-in relationship providing the attachment of said convex and socket members as a ball and socket joint and permitting limited universal relative movement between said members, a rigid bracket means having a partially concave portion engaging a portion of each of said convex members and retaining each of said convex members in one of said socket members, fastening means extending through said bracket means and socket members for securing said rack to said outer surface, said rigid bracket means including a portion thereof bearing against the upper surface of said frame thereby preventing upward movement thereof.

4,030,648
CARRIER SUPPORT APPARATUS

Melvin Kermit Johnson, Lake Orion, and Regis Victor Pilarski, Utica; Jay Walter Jensen, Romeo, all of Mich., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sept. 20, 1976, Ser. No. 724,646
Int. Cl.² B62J 1/28
U.S. Cl. 224—31 8 Claims



1. In an auxiliary bicycle seat and carrier support apparatus, the combination comprising:

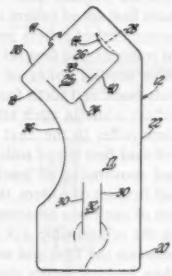
a carrier member, said carrier member provided with support rack engaging channel means on the bottom thereof, said carrier member provided with a downwardly depending buttress element in front of said support rack engaging channel means; and

a support rack adapted for selective mounting upon a bicycle frame, said support rack configured for mating engagement with said channel means, said support rack provided with an integral biased latch member adapted to engage said buttress element so as to lockably retain said carrier member in mating engagment with said support rack.

4,030,649
CLOTHES HANGER CARRIER

Victor W. Potoroka, 8610 S. Keeler Ave., Chicago, Ill. 60652

Filed Apr. 1, 1976, Ser. No. 672,545
Int. Cl.² B65D 71/00
U.S. Cl. 224—45 T 5 Claims

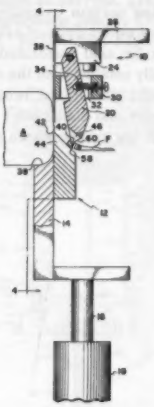


1. An over-the-shoulder carrier for hand carrying articles such as one or more clothes hangers of the type having a garment-support portion and an open hook extending from the top of the support portion, said carrier comprising a single-piece and single thickness body, free of separate assembled elements, stamped or otherwise formed from suitable sheet material of commercially uniform thickness, said body having a longitudinal general centerline. a handle end having a free edge disposed at an angle within the plane of said body and not normal to said centerline and adapted to be rolled to form part of a tubular handle, a hanger hook-engaging end formed near its middle with spaced longitudinal cuts to provide a hook-engaging loop and an intermediate shoulder-engaging portion connecting said ends and being free of fadded elements said body having substantially flat opposite sides both free of any projections which extend normal to the plane of said body so as to be reversible for right or left shoulder carrying.

4,030,650
TAIL FLASH REMOVAL APPARATUS

John W. Oberloier, Beaverton, Mich., assignor to Lyle Development, Inc., Beaverton, Mich.

Filed July 8, 1976, Ser. No. 698,732
Int. Cl.² B26F 3/02
U.S. Cl. 225—100 6 Claims



1. Apparatus for removing an integral web of flash from a molded plastic article such as a container or the like, said apparatus comprising opposed first and second jaw assemblies mounted for reciprocatory movement toward and away from each other between a spaced apart open position and an overlapped actuated position, article seating means on one of said jaw assemblies operable when said assemblies are in their open position to locate an article having an integral web of flash on said one of said jaw assemblies with said web projecting between said jaw assemblies, spaced apart flash engaging teeth on each of said jaw assemblies, the teeth on one jaw assembly being aligned with the spaces between the teeth on the other of said jaw assemblies, inclined cam surfaces on the teeth of said first jaw assembly for forcing flash engaged between the teeth of said assemblies outwardly away from said article as said jaw assemblies move toward said actuated position, and hinge means on said second jaw assembly accommodating outward movement of the teeth of said second jaw assemblies with said flash.

4,030,651
INTERFLOOR TUBE ASPIRATOR MUFFLER

William Robert Weiss, Walnut Creek, Calif.; James Judson Cooksey, Colonial Heights, Va.; Wilbur Leon Stables, Matoaca, Va., and Harry Lee Newell, Jr., Richmond, Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 21, 1976, Ser. No. 725,055
Int. Cl.² B65H 17/32; C10K 11/04
U.S. Cl. 226—97 12 Claims

8. An apparatus to convey a continuous running length of yarn through an obstruction for use during the production of multifilament, synthetic yarn, said apparatus comprising:

A. an elongated tube, said elongated tube having an entrance and an exit end for yarn passage;

B. a source of air under pressure, said source of air under pressure being connected to said elongated tube so as to create a suction therethrough when operational; and

C. a muffler, said muffler being located downstream of said source of air under pressure and being connected to and replacing a portion of said elongated tube corresponding in length to said muffler, said muffler comprising:

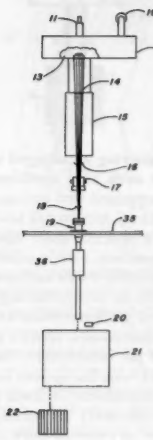
i. housing means, said housing means comprising:

a. an inlet end, said inlet end being shaped so as to couple with said elongated tube downstream of said source of air under pressure without blocking said yarn passage therethrough;

b. an outlet end, said outlet end being shaped so as to couple with said elongated tube upstream of said exit end of said elongated tube without blocking said yarn passage therethrough; and

c. an elongated section extending between said inlet end and said outlet ends of said housing means;

ii. a perforated tube, said perforated tube having a diameter substantially smaller than the diameter of said housing means, said perforated tube being disposed between said inlet and said outlet ends of said housing means and having an open area of from 40 to 60%.



iii. a plurality of baffle means, said baffle means being disposed approximately perpendicular to the central axes of said perforated tube and said housing means and being shaped so as to encircle said perforated tube with their peripheries being surrounded by said elongated section of said housing means, said baffle means forming in conjunction with said perforated tube and said housing means a plurality of annular resonant chambers; and

iv. sound absorbing material disposed throughout each of said resonant chambers;

D. means for connecting said inlet end of said housing means with said elongated tube downstream of said source of air under pressure; and

E. means for connecting said outlet end of said housing means with said elongated tube upstream of said exit end;

whereby the noise level of said apparatus when said source of air under pressure is operational is reduced up to 33.5 Δ dB (A) by said muffler.

4,030,652

EQUALIZING DEVICE FOR MOVEMENTS IN PACKING MACHINES, ESPECIALLY MACHINES FOR MAKING BAGS AND THE LIKE

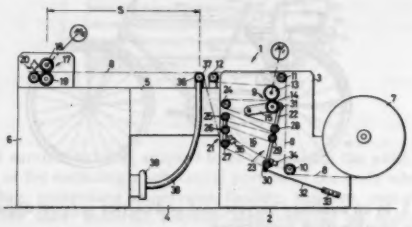
Ehrhart Schulze, Fellbach, Germany, assignor to Felix Stiegler Maschinenfabrik, Stuttgart, Germany

Filed Apr. 5, 1976, Ser. No. 673,421

Claims priority, application Germany, Apr. 3, 1975, 2514600

Int. Cl.² B65H 17/42

U.S. Cl. 226—114 **3 Claims**



1. In combination: supply reel means for receiving and supplying foil-shaped packing material, first withdrawing means for withdrawing packing material from said supply reel means, first driving means for continuously driving said first withdrawing means, equalizing means for receiving withdrawn packing material from said first withdrawing means and equalizing the movement thereof, second withdrawing means for withdrawing packing material from said equalizing means, and second driving means for intermittently driving said second withdrawing means, said equalizing means including a pivotally supported lever with a first set of rotatably mounted rollers differently spaced from each other, said equalizing means also including stationary supporting means, a second set of rotatably mounted guiding rollers supported by said supporting means and equally spaced from each other, spring means continuously urging said pivotally supported lever to pivot said first set of rollers away from said second set of rollers, said first set of rollers and said second set of rollers being arranged relative to each other so as to permit passing packing material received by said first withdrawing means over a first roller of said first set of rollers and from there over a first roller of said second set of rollers and from the latter to the successive second roller of said first set of rollers, and from there to the successive second roller of said second set of rollers and successively back and forth from one set of rollers to the other set of rollers while in each set of rollers progressively passing from one roller to the next roller, the distance between the rollers of said first set of rollers increasing in the direction of intended movement of packing material from over the rollers of said first set of rollers, the distance between the centers of rotation of each two adjacent rollers of said first set of rollers meeting the relationship $a \times 2^n$ in which a designates the distance between the first and second rollers of said first set of rollers when looking in the direction in which the packing material is to move in succession over the rollers of said first set of rollers, and in which n stands for a whole number of the row of numbers 0,1,2,3,4 . . . designating the order of the respective distance.

4,030,653

METHOD AND APPARATUS FOR SPLICING TIRE CORD FABRIC

Joel M. Kahaner, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 17, 1973, Ser. No. 398,053

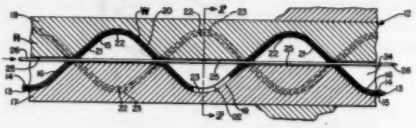
Int. Cl.² B27F 7/02

U.S. Cl. 227—25 **9 Claims**

1. A splicing apparatus used in axially joining two pieces of

fabric composed of longitudinally extending warp cords held in parallel array by weft threads, comprising:

a. means for holding adjacent ends of the two pieces of fabric in overlapped relation such that the warp cords of the overlapped ends are generally parallel, said means including means for forming parallel rows of waves of interconnecting troughs and ridges in the overlapped ends such that, (i) the longitudinal axes of the rows are parallel and angularly disposed to the warp cords, and (ii) the troughs and ridges of adjacent rows of waves are staggered transversely of the overlapped ends of fabric;



b. at least one pair of combs with outstanding teeth for splicing the overlapped ends of fabric, the teeth of each of the combs being a plurality of parallel splicing rods which are connected at one end thereof; and

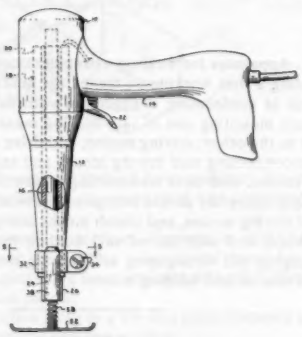
c. means for guiding the combs into splicing engagement with the overlapped ends of fabric from opposing longitudinal sides thereof, said means including means for guiding the plurality of splicing rods of each of the combs into piercing engagement with, and through the waves of alternate rows of waves intermediate the troughs and ridges thereof, such that the splicing rods, like each of the rows of waves, are angularly disposed to the warp cords.

4,030,654

HAMMER TOOL FOR CARPET STRIP

Alvin York, Kouts, Ind., assignor to Eva Imogene Jefferson, Wheatfield, Ind. and Peggy Joe Koehler, Valparaiso, Ind., part interest to each

Filed July 22, 1976, Ser. No. 707,752
Int. Cl.² B25C *7/00*
U.S. Cl. 227—110 **6 Claims**



1. A hammer device for driving nails in a carpet strip comprising:

a hammer shaft;

housing means supporting said hammer shaft for reciprocating movement;

drive means for imparting reciprocating movement to said hammer shaft;

a tubular member forming the distal end of said housing means;

sleeve means on said housing means;

elongated means longitudinally movable in said sleeve means;

spaced guide runners for straddling said carpet strip provided at the distal end of said elongated means; and

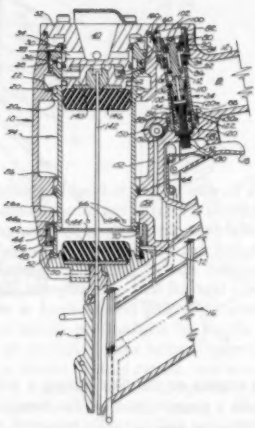
spring means coacting between said sleeve means and said elongated means for biasing said guide runners spaced from said sleeve means.

4,030,655

IMPROVED FASTENER APPLYING DEVICE

Robert G. Rothfuss, Bellevue, Ky., and Carl T. Becht, Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Continuation of Ser. No. 446,632, Feb. 28, 1974, abandoned, which is a continuation of Ser. No. 210,812, Dec. 22, 1971, abandoned. This application Jan. 8, 1976, Ser. No. 647,430
Int. Cl.² B25C *1/04;* **F15B** *13/042*
U.S. Cl. 227—130 **7 Claims**



1. In a fastener applying device including a tool body adapted to be connected to a supply of air under pressure, a cylinder in said tool body, a piston and fastener driver reciprocable in said cylinder in opposed working and return strokes from a full up position to a full down position and back, a return air reservoir in said body, a first port communicating between said cylinder and said reservoir just above the full down position of said piston, a resilient bottom stop free of engagement with said cylinder, and means in said tool body fixing said stop to said tool body, the improved structure comprising:

a. a first vent passage providing communication between the lower portion of said cylinder and atmosphere,

b. a second vent passage providing communication between the upper portion of said cylinder and atmosphere,

c. a second port communicating between said return air reservoir and said cylinder adjacent the lower end thereof,

d. said cylinder incorporating an external annular valve element, and being reciprocable in said tool body,

e. said tool body presenting an internal annular valve seat cooperating with said annular valve element to constitute a main valve for controlling air into said cylinder,

f. said tool body at its lower end having an annular sealing element below said first vent passage,

g. the lower end of said cylinder engaging said sealing element when said cylinder is in main valve closing position,

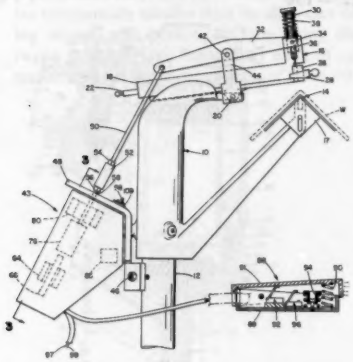
h. the upper end of said cylinder having a portion to close said second vent passage when said cylinder is in main valve opening position,

i. said cylinder having also a portion to close said second port when said cylinder is in main valve opening position;

whereby, when said cylinder is moved to main valve opening position, concurrently said first vent passage is opened, said

second vent passage is closed, and said second port is closed; and when said cylinder is moved to main valve closing position, concurrently said first vent passage is closed, said second vent passage is opened, and said second port is opened.

4,030,656
STAPLER
Stanley H. Gordon, Concord, Mass., assignor to Acme Staple Company, Inc., Franklin, N.H.
Filed Aug. 9, 1976, Ser. No. 712,689
Int. Cl.² B27F 7/22
U.S. Cl. 227—131 **16 Claims**



8. In a stapler or the like having a driving head pivotally mounted on a support member for movement toward an anvil and an operating rod pivotally mounted on said driving head and extending therefrom adjacent said support member for moving said driving head,

an electromagnetic power device for moving said operating rod comprising

plunger means mounted on said support member for linear movement through an advancing stroke from a first inoperative position to a second position and through a driving stroke from said second position toward a third position

advancing coil means for moving said plunger means from said first position to said second position

driving coil means for moving said plunger means from said second position toward said third position and

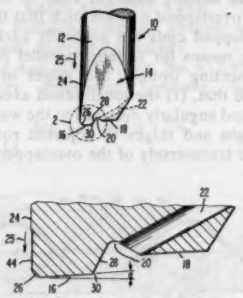
circuit means including sequentially operable switch means for energizing first said advancing coil means and thereafter said driving coil means to move said plunger means first through said advancing stroke and thereafter through said driving stroke.

4,030,657
WIRE LEAD BONDING TOOL
Harvey Dow Gibson Scheffer, Westfield, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Dec. 26, 1972, Ser. No. 318,530
Int. Cl.² B23K 21/02
U.S. Cl. 228—1 R **2 Claims**

1. A wire bonding tool for ultrasonically bonding a lead to a contact comprising:

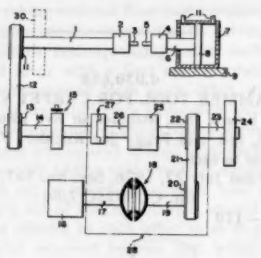
an elongated shank portion extending in a first direction,

a tip portion disposed at one end of said shank portion, said tip portion having a forward edge, a rearward edge and a planar bottom surface for engaging said lead during said bonding, said bottom surface tapering toward said shank portion in a second direction from said forward edge to



said forward edge such that said bottom surface forms an angle of less than 90° with said first direction.

4,030,658
FRICTION OR INERTIA WELDING APPARATUS
Thomas D. Parrish, 4504 Cedardale Lane, Flushing, Mich. 48433
Filed Aug. 5, 1976, Ser. No. 711,734
Int. Cl.² B23K 27/00
U.S. Cl. 228—2 **7 Claims**



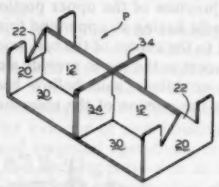
1. Apparatus for welding workpieces comprising means for holding a first workpiece; means for holding a second workpiece in confronting engagement with said first workpiece; means mounting one of said holding means for rotation relative to the other; driving means; and drive transmitting means interconnecting said driving means and said one of said holding means, said drive transmitting means including a flywheel, torque converter means interposed between said flywheel and said driving means, and clutch means interposed between said flywheel and said one of said holding means for selectively engaging and disengaging said driving means with and from said one of said holding means.

4,030,659
PARTITION ARRANGEMENT
Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.
Filed June 28, 1976, Ser. No. 700,389
Int. Cl.² B65D 5/48
U.S. Cl. 229—42 **2 Claims**

1. In a heavy duty four cell partition arrangement formed from a unitary blank of sheet material such as paperboard or the like, the combination of:

a. a vertically disposed first double-ply center member including a pair of co-extensive panels hingedly interconnected at their upper edges and disposed in face to face relation;

b. a vertically disposed second double-ply center member extending normal to said first center member and including a pair of co-extensive panels disposed in face to face relation and presenting in their upper edges slots aligned with similar slots presented in the lower edges of the panels of said first center member to provide interlocking engagement between said first and second center members;



c. a pair of vertically disposed opposed end members which are parallel to the plane of said second center member, and which have portions foldably joined to end edges of said first center member by integral gusset elements;

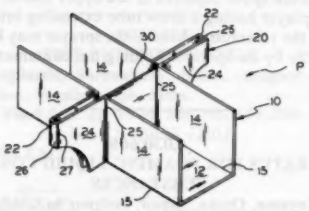
d. a horizontally disposed bottom wall including a pair of co-planar bottom wall panels each being foldably connected at its opposite end edges to lower edges of one of said end member panels and to one of said second center member panels.

4,030,660

PARTITION ARRANGEMENT

Joseph J. Rada, Country Club Hills, and Jeffrey M. Gardner, Wheaton, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Oct. 1, 1976, Ser. No. 728,512
Int. Cl.² B65D *5/48*
U.S. Cl. 229—42 **2 Claims**



1. In a multi-cell partition formed from a unitary blank of foldable sheet material such as paperboard, the combination of:

a. a pair of longitudinal sections disposed in end-to-end relation and each comprising a horizontal panel having joined to and upstanding from opposed side edges thereof a pair of vertical panels;

b. a transverse section lying in a vertical plane between said longitudinal sections and comprising:

i. a pair of outer members each including a pair of vertical panels foldably joined to and extending outboardly from related end edges of respective longitudinal section vertical panels and having outboard edges foldably joined to each other;

ii. an inner member including a pair of parallel vertical panels foldably joined to and extending upwardly from related end edges of respective longitudinal section horizontal panels and having upper edges joined to each other;

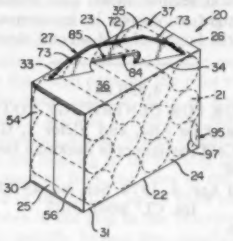
iii. said inner member vertical panels having extensions which project outboardly of said longitudinal section vertical panels and which are interposed between the respective outer member vertical panels to provide added strength for said partition.

4,030,661

CARTON AND BLANK FOR MAKING SAME

Melville T. Farquhar, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Apr. 12, 1976, Ser. No. 675,754
Int. Cl.² B65D *5/46*
U.S. Cl. 229—52 B **20 Claims**



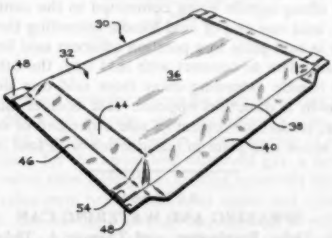
1. A carton comprising, a bottom wall, a pair of side walls adjoining opposite side edges of said bottom wall with each of said side walls having an edge remote from said bottom wall, a pair of extension flaps each adjoining and extending from an associated remote edge, said extension flaps being fastened together to define a rectangular top wall for said carton, and cut and score means in each of said pair of extension flaps defining an associated handle portion with the handle portions from only said pair of extension flaps being disposed against each other to define a handle for said carton, said score means in each extension flap including a pair of spaced score lines disposed in spaced relation substantially along a diagonal in opposite corners of said rectangular top wall to thereby define an integral hinge for an associated handle portion, said diagonal score lines in said corners providing a comparatively rigid attachment for said handle portions with said rigid attachment assuring said handle has optimum strength due to less likelihood of upward bowing of said top wall.

4,030,662

PACKAGE AND METHOD AND APPARATUS FOR PRODUCING SAME

Larry C. Gess, 13345 Dunlap Road, La Salle, Mich. 48145

Filed May 14, 1975, Ser. No. 577,354
Int. Cl.² B65D *65/12, 65/14, 75/36*
U.S. Cl. 229—87 R **9 Claims**



1. A package for containing an object, said package comprising a first sheet of material having an object-receiving central portion with two straight opposite side edges and two end edges, said sheet having two upstanding side walls along the opposite side edges thereof, and two outwardly-extending flanges at the outer edges of the side walls, only end portions

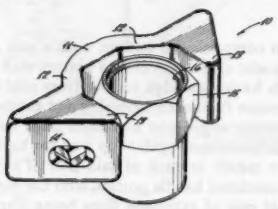
of said side walls being bent outwardly on themselves along lines which extend longitudinally of the side walls and are centrally located between longitudinal edges of the side walls with intermediate portions of said side wall between said end portions being straight and with inner surfaces of said end portions which would otherwise face the object being in contiguous relationship, and a second sheet of material, the width of which is less than that of said first sheet by substantially the heighth of both of the side walls, said second sheet having side edge portions affixed to said outwardly-extending flanges and having end portions affixed to end portions of said first sheet to form a closed spaced between the central portion of said first sheet and said second sheet, said second sheet being substantially straight as viewed in transverse cross section anywhere along the length of said second sheet.

4,030,663

TUBE ADAPTOR FOR CENTRIFUGE ROTOR BUCKET

Thomas E. Conn, Palo Alto, and Victor J. Grilli, Mountain View, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 4, 1974, Ser. No. 457,710
Int. Cl.² B04B *5/02*
U.S. Cl. 233—26 **3 Claims**



1. An apparatus having a centrifuge bucket for supporting test tubes, said apparatus comprising:

a thin, flat, disc-shaped plate having a diameter adapted to be fit within the inside diameter of the cavity of the centrifuge bucket and having an axial aperture located in the center of said plate;

a first series of partitions circumferentially spaced along the outer edge of said plate and made integral with and extending normal to one side of said plate;

a second series of partitions circumferentially spaced within said first series of said partitions on said plate and made integral with and extending normal to said one side of said plate;

a thin, flat, disc-shaped tray having a diameter slightly less than the diameter of said bucket, said plate having a bottom side opposite said one side of said plate, said tray located adjacent said bottom side of said plate; and

an elongate, generally rod-shaped lifting handle, one end of said lifting handle being connected to the center of said tray, said one end of said handle extending through said hole in said plate to a position adjacent said bottom side of said plate to connect with said tray, the other end of said handle extending away from said one side of said plate in a direction opposite said bottom side of said plate, so that movement of said other end of said handle will move said plate in conjunction with said tray.

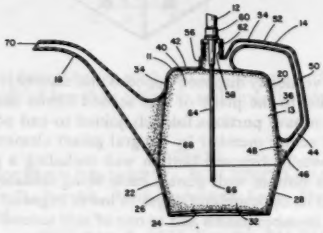
4,030,664

SPRAYING AND WATERING CAN

Cosmo N. Tisbo, Barrington, and Thomas A. Tisbo, Roselle, both of Ill., assignors to Custom Plastics, Inc., Elk Grove Village, Ill.

Filed Apr. 12, 1976, Ser. No. 675,712
Int. Cl.² A01G *25/14*; B05B *9/043*
U.S. Cl. 239—289 **1 Claim**

1. A spraying and watering can adapted to deliver selectively water or water mist to a plant comprising: a blow-molded polyethylene integral container having a substantially closed reservoir, said reservoir having a substantially rectangular bottom, said bottom being crowned inward of the reservoir to improve the stability of the container, said reservoir having a lower portion formed integral with the bottom, an upper portion formed integral with the lower portion and having a substantially rectangular top formed integrally therewith, a hollow generally C-shaped handle having its lower end formed integral with a narrower side of the upper portion adjacent to the junction of the upper portion with the lower portion, said handle having an upper end formed integral with the top adjacent to the center of the top, said handle having a grip portion adjacent to the top to provide a convenient means for holding the container, said hollow handle providing a conduit between the portion of the reservoir adjacent to the



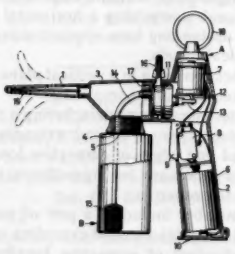
junction between the upper portion and the lower portion and the top of the reservoir, said handle having a vent in the grip portion adjacent to the junction of the handle with the top of the reservoir, a curved tapered spout having one end formed integral with a narrower side of the upper portion opposite the side having the lower end of the handle formed integral therewith and the other end having an opening for pouring water from said reservoir, a sprayer sealingly mounted in the top adjacent to the center of the top and positioned in line with the handle and the spout and being positioned between the handle and the spout adjacent to the upper end of the handle, and said sprayer having a draw tube extending into the lower portion of the reservoir, whereby the sprayer may be operated conveniently by an operator holding the container at the grip portion.

4,030,665

APPARATUS FOR FOAMING LIQUID COSMETIC SUBSTANCES

Masaya Koyama, Osaka, Japan, assignor to Goldwell GmbH, Darmstadt-Eberstadt, Germany

Filed July 9, 1975, Ser. No. 594,468
Int. Cl.² A61M *11/02*; B05B *9/04*; B01F *5/18*
U.S. Cl. 239—373 **7 Claims**



1. A portable hand-held electrical apparatus for foaming liquid cosmetic substances having a self-contained electrical supply, comprising:

a pistol-like housing including a housing part and a handle

part, said housing part having an interior space, a bulkhead in said interior space separating said housing part into a pumping chamber and a flow communication chamber, said flow communication chamber having an inlet means and an outlet means;

a vessel connected to said inlet means for flow communication between said vessel and said flow communication chamber for supplying a supply of a cosmetic substance adapted to be foamed and removably connectable with said housing part;

an air supply duct having one end entering said vessel and another end connected to said bulkhead with the portion therebetween in said flow communication chamber;

air pump supply means including an electrically driven pump in said pumping chamber having an inlet communicating with the exterior of said housing part to obtain ambient air and an outlet operatively connected to said other end of said duct for passing an air stream into said duct through said flow communication chamber;

electrical supply containing means in said handle part including means connected to said electrically driven pump for energization thereof to drive said electrically driven pump;

said means to drive said pump comprising:

an electric motor for driving said pump, and

a battery insertable into said electrical supply containing means for providing said self-contained electrical supply;

foam generator means in the form of a porous open-cell member immersed in the substance and being disposed at said one end of said air supply duct and receiving said air stream supplied thereto by said pump through said duct and introducing said air stream into the substance in the form of a plurality of small bubbles to produce foam; and

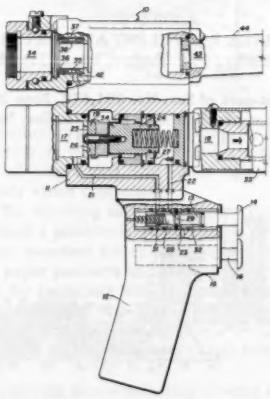
a resilient delivery nozzle means connected to the outlet means of said flow communication chamber of said housing part and communicating with said vessel through said flow communication chamber for dispensing the foam developed in said vessel, said resilient delivery nozzle means being bendable in all directions for altering thereof in relation to the position of the hand-held apparatus.

4,030,666

FIRE FIGHTING NOZZLE

John P. Gagliardo, Shrewsbury, Mass., assignor to Feecon Corporation, Westborough, Mass.

Filed Jan. 22, 1976, Ser. No. 651,290
Int. Cl.² B05B 11/02
U.S. Cl. 239—526 **20 Claims**



1. Fire fighting nozzle, comprising

a. a housing,

b. a hand grip extending from the housing,

c. a pilot valve mounted in the hand grip with an actuating button extending from the hand grip in position for operation by a finger, the pilot valve consisting of a spindle slidably carried in a bore in the hand grip, the spindle extending from the bore and from the grip to constitute the said actuating button,

d. an inlet opening in the housing,

e. an outlet opening in the housing,

f. a main valve located in the housing, the main valve comprising an axially-slidable piston having a first end of small area engaging a valve seat and a second end of relatively large area to which fluid from the inlet opening is admitted by the pilot valve, and

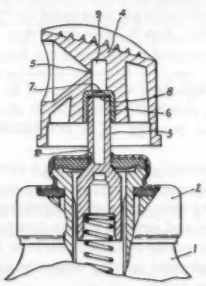
g. passages connecting the inlet opening to the pilot valve and to the main valve, the pilot valve normally causing fluid from the inlet opening to maintain the main valve in a first condition wherein fluid cannot pass from the inlet opening to the outlet opening, the pilot valve on occasion allowing the main valve to move to a second condition wherein fluid is allowed to pass from the inlet opening to the outlet opening, a first passage extending from the inlet opening in the housing to the bore in the grip, a second passage extending from the bore in the grip to the said second end of the piston, and a third passage extending from the bore in the grip to the exterior of the grip, the pilot valve spindle having two axially-spaced reduced portions one of the reduced portions bridging the first and second passages when the pilot valve is in its normal condition, while the other reduced portion bridges the second and third passages when the pilot valve has its button depressed.

4,030,667

PUSH-BUTTON HAVING A CALIBRATED OUTLET FOR A CONTAINER UNDER PRESSURE

Felix Francois Le Guillou, Le Neubourg, France, assignor to Establissements Valois S.A., Le Neubourg, France

Filed June 5, 1975, Ser. No. 584,229
Claims priority, application France, June 5, 1974, 74.19302
Int. Cl.² B05B 1/34
U.S. Cl. 239—573 **1 Claim**



1. In an aerosol valve for atomizing a liquid having a propulsive gas dissolved therein, and including a cap member adapted to be sealingly secured to a top opening of a pressurized container for the liquid and dissolved gas, a hollow, depressable valve stem slidingly extending upwardly through the cap, said valve stem being open at its upper end, closed at its lower end, and having a passageway through a wall thereof communicating with the hollow interior of the stem whereby the liquid and dissolved gas may be charged into or discharged from the container when the valve stem is depressed, and means biasing the valve stem upwardly against the cap member, the improvements characterized by:

a. a push-button having a recessed end for removable fit over the upper end of the valve stem,

b. a hollow expansion chamber formed within the push-but-

ton, opening to the recess and configured to form a continuation of the hollow valve stem when the push-button is mounted thereon,

c. a spray nozzle within said push-button, and opening laterally to said hollow expansion chamber,

d. an atomizing opening communicating the expansion chamber and the spray nozzle,

e. means within the recess face of said push-button for defining a small diameter orifice at the lower end of the expansion chamber, said orifice having a diameter smaller than that of the atomizing opening, serving as the sole means of fluid communication between the hollow valve stem and the expansion chamber, such that said orifice permits continued expansion of the liquid and dissolved gas in the expansion chamber after push-button release and thereby preventing a solid liquid discharge stream, the formation of large liquid droplets, and the overflow of liquid from the spray nozzle when the push-button is released after a discharge operation, and

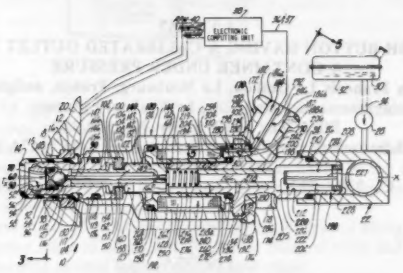
f. a filter screen disosed within said recess and overlying and adjacent to and being upstream of said orifice.

4,030,668

ELECTROMAGNETICALLY OPERATED FUEL INJECTION VALVE

Alexander Michael Kiwior, Warren, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed June 17, 1976, Ser. No. 697,173
Int. Cl.² B05B *1/14*
U.S. Cl. 239—585 **7 Claims**



2. In a fuel injection valve adapted to be suitably mounted on an internal combustion engine so as to be communicated with an intake passage of a combustion chamber thereof comprising:

a. actuator housing means having a central actuator housing stepped-bore therethrough along a valve axis, said actuator housing stepped bore comprising an actuator portion;

b. valve seat and orifice means comprising a metering orifice and a partly-spherical surface about said valve axis having a circular seating edge circumscribing said metering orifice; and

c. actuator means comprising armature means and valve head and stem means,

i. said armature means comprising a guide element, an armature element, and a central passage through at least said guide element, said guide element being loosely received in said actuator portion, and said armature element comprising a flow inlet passage communicating with said central passage, and

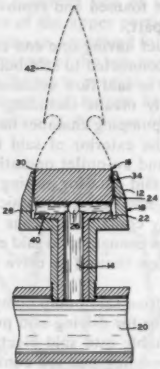
ii. said valve head and stem means comprising a flexible stem with a stem length intermediate a free end and a fixed end, said free end terminated in at least a partly spherical valve head slightly smaller than said partly spherical surface so as to cooperate with said circular seating edge thereof to provide a circular seal, said fixed end fixed centrally to said armature element, and said stem length telescoped by and flexible within said central passage.

4,030,669

BURNER, ESPECIALLY FOR GASEOUS FUELS

Fausto Celorio Mendoza, Cumbres de Acultzingo No. 185, Mexico 10, D.F., Mexico

Filed Feb. 21, 1975, Ser. No. 551,659
Int. Cl.² B05B *1/06*
U.S. Cl. 239—590 **3 Claims**



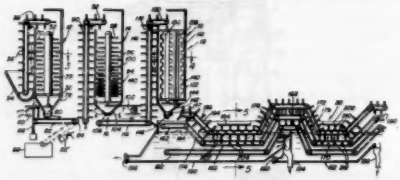
1. A burner, especially for gaseous fuels, comprising; an outer body, a recess formed into one end of said outer body having a side wall, an inner body disposed in said recess and having a side wall spaced from said side wall of said recess and forming a turbulence chamber surrounding said inner body, said side walls forming an annular gas discharge gap therebetween at the outer end of said recess, the side walls of said inner and outer bodies converging with the axis of said recess toward said gap, said recess having a shoulder at the bottom facing the open end of the recess, said inner body having a shoulder facing away from the open end of the recess and engaging the said shoulder at the bottom of the recess, said inner body having a flat end in about the plane of the open end of the recess, said outer body having a central tubular shank projecting therefrom at the end opposite said recess, said inner body having a stem fitted into said shank of said outer body, and conduit means for supplying gaseous fuel to the turbulence chamber in a region thereof spaced axially from said gap.

4,030,670

GARBAGE RECYCLING APPARATUS

Frank W. Abernathy, 603 Shadow Lane, Jonesboro, Ark. 72401

Continuation-in-part of Ser. No. 484,450, June 28, 1974, abandoned. This application Dec. 17, 1975, Ser. No. 641,592
Int. Cl.² B02C *21/00*
U.S. Cl. 241—14 **20 Claims**



1. The method of recycling compacted waste including various forms of paper and pulp wood products, metal and glass containers, and plastics, said method comprising:

a. decompacting the waste at a metered rate;

b. weighing the decompacted waste at a metered rate and

separating the heavier portions of waste from the remainder thereof;

c. coarse shredding the remaining waste at a metered rate and in a manner to gradually reduce the remaining waste to increasingly smaller shredded material;

d. fine shredding the shredded material at a metered rate;

e. passing the fine shredded material through a pulverizing mill at a metered rate to break up and pulverize the pieces of glass therein;

f. moving the discharge from the pulverizing mill through a wash bath on an upper foraminated horizontal conveyor belt disposed above a lower generally horizontal conveyor belt while subjecting the material being washed to alternating upward and downward jets of air under pressure;

g. collecting the smaller particles of glass which fall through the foraminated belt on the lower belt;

h. passing the remaining washed material through a second rinse bath on an upper foraminated horizontal conveyor belt disposed above a lower generally horizontal belt supporting the collected smaller particles and subjecting the remaining washed material on the upper belt to further alternating up and down jets of air under pressure and collecting, on the lower belt, the smaller particles of glass which fall through the upper belt;

i. separately drying the remaining washed material and the collected particles of glass;

j. spreading the remaining dried material in a thin layer and acting upon the thin layer with a field of magnetic flux to remove the ferrous materials therefrom; and

k. electrostatically separating particles of aluminum from the remaining material after the magnetic separation of ferrous materials therefrom.

4,030,671

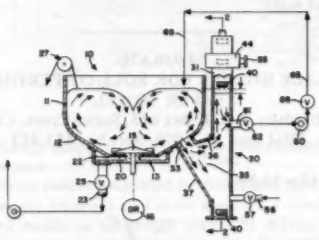
APPARATUS FOR PULPING WASTE PAPER MATERIALS

Joseph Walter Couture, Dorval, Canada, assignor to The Black Clawson Company, Middletown, Ohio

Filed June 4, 1976, Ser. No. 692,885

Int. Cl.² B02C *23/36*

U.S. Cl. 241—15 **8 Claims**



7. The method of operating apparatus for recovering paper making fiber from waste paper products including substantial quantities of plastic film and other lightweight non-paper contaminants which comprises:

a. a tub for receiving such waste paper products and water to at least a predetermined minimum level,

b. a rotor mounted for rotation in said tub to pulp such waste paper products to aqueous slurry form,

c. means for extracting from said tub a liquid suspension of small particles of less than a predetermined maximum size,

d, an outlet in said tub bottom separate from said extracting means,

e. junk removing means including a casing adjacent said tub and of at least the same height, and

f. a chute connecting said outlet with said casing and providing for liquid flow between said tub and said casing, which method comprises the steps of:

i. intermittently withdrawing liquid from said casing at a level below said minimum level in said tub at a sufficient rate to reduce the liquid level in said casing below that in said tub and thereby to induce flow of liquid and lightweight contaminants from said tub to said casing by way of said chute,

ii, collecting and removing the lightweight contaminants which accumulate in the upper portion of said casing, and

iii, recirculating said withdrawn liquid back to said tub.

4,030,672

PROCESS AND AN APPARATUS FOR PRODUCING FLUFFED FIBER MATERIALS

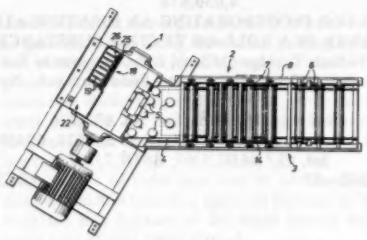
Lennart Rickard Borgqvist, Oxie, Sweden, assignor to Kamas Industri Aktiebolag, Malmo, Sweden

Filed Jan. 27, 1976, Ser. No. 652,690

Claims priority, application Sweden, Jan. 31, 1975, 7501080

Int. Cl.² B02C *13/286*

U.S. Cl. 241—18 **16 Claims**



1. A process for providing fluffed fibrous material from cellulosic, in particular fibrous materials, by defibration, the process comprising feeding both blocks of cellulosic materials and at least one strip of cellulosic materials from a roll continuously into a defibration unit, disintegrating said blocks and strips in a dry state by means of yielding impact elements mounted on a rotor, the disintegrated material thus obtained being fluffed and mixed so as to form a homogenous mixture, and discharging said mixture through a sieve.

4,030,673

DOUBLE WIRE-WINDING MACHINE WITH AUTOMATIC TRANSFER

Louis Veyrassat, Rolle, Switzerland, assignor to Maillefer S.A., Switzerland

Filed Sept. 8, 1975, Ser. No. 611,147

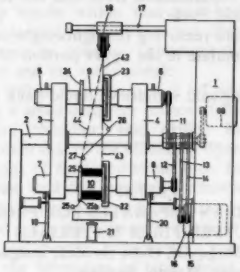
Claims priority, application Switzerland, Sept. 27, 1974, 13126/74

Int. Cl.² B65H *67/04*

U.S. Cl. 242—25 A **6 Claims**

1. A double winding machine for winding metal wire and having an automatic wire-transfer device, said machine comprising a support, two pairs of coaxial reel-spindles borne by said support, at least two reels, each provided with a wire-securing groove and adapted to be held by a respective said pair of reel-spindles, two snagging members, each mounted on a respective said reel-spindle of each of said pairs, and a deflection device operated at the time of said transfer for changing the path of travel of said wire, wherein said deflection device comprises wire-pushing means adapted to engage said wire in a said snagging member associated with an empty said reel, a deflector adapted to cause relative displacement of said path of travel of said wire with respect to a full said reel

in the vicinity thereof for engaging said wire in said securing groove of said full reel, and control means for actuating both



said wire-pushing means and said deflector, said control means being arranged for actuating said deflector just prior

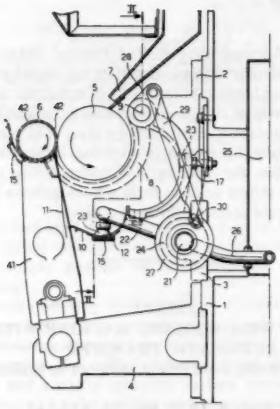
---

4,030,674

DEVICE FOR INCORPORATING AN IDENTIFICATION MARKER IN A ROLL OF TEXTILE SUBSTANCE

Augusto Vedani, Turbigo (Milan), Italy, assignor to Sant'Andrea Novara Officine Meccaniche e Fonderie S.p.A., Novara, Italy

Filed Apr. 15, 1976, Ser. No. 677,206
Claims priority, application Italy, Oct. 3, 1975, 69459/75
Int. Cl.² B65C 5/00; B65H 75/02
U.S. Cl. 242—55 12 Claims



1. An automatic device for incorporating an identification marker in a reel or roll of a textile substance wound on a rotary support member, the device comprising:

stationary support means;

a container for holding a plurality of the markers;

an applying member for placing a new leading end of the textile substance against the rotary support member, for commencing winding, the applying member being movably mounted on the support means;

a marker positioning means for automatically removing a respective marker from the marker container and positioning the marker on the applying member, the marker positioning means being movably mounted on the support means;

drive means for actuating the marker positioning means to position the marker on the applying member;

drive means for actuating the applying member to place the textile substance leading end and the marker against the rotary support member; and

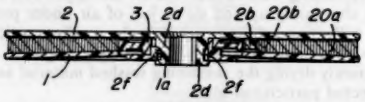
coordinating means coordinating the actuation of the marker positioning means drive means and the applying member drive means, whereby the marker positioning means positions the marker on the applying member before the applying member reaches the rotary support member and places the textile substance leading end and marker against the rotary support means.

4,030,675

APPARATUS FOR FILM AND TAPE WINDING

Werner Eissfeldt, Blutenstrasse 3, 62 Wiesbaden-Rambach, Germany

Filed Jan. 26, 1976, Ser. No. 652,044
Claims priority, application Germany, Jan. 25, 1975, 2503116
Int. Cl.² G11B 23/02; B65H 75/22
U.S. Cl. 242—55.18 12 Claims



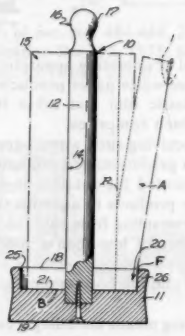
1. Apparatus for the handling and storage of recorded tapes or motion picture film on reproducing apparatus without the necessity of rewinding after use, said apparatus comprising a pair of spaced first and second reel plates (**1**, **2**, **9**, **10**), said first plate being stationary and having a hub (**2***d*, **9***d*) extending centrally and axially therefrom and being attached centrally and axially to said second reel plate, said second reel plate having winding means (**3**, **9***a*) thereon, an exit opening (**2***c*, **10***d*) in said first reel plate, and means for varying the distance between the reel plates whereby tape or film stored in a wound roll in said apparatus may be pulled through said exit opening when said distance is enlarged, said wound roll then being free to rotate together with said winding means on said second reel plate.

4,030,676

PORTABLE HOLDER FOR ROLL OF PERFORATED PAPER TOWEL

James G. Bardsley, Rte. 1, Box 645, Sutter Creek, Calif. 95685

Filed Jan. 29, 1976, Ser. No. 653,452
Int. Cl.² A47K 10/16
U.S. Cl. 242—55.54 4 Claims



1. A free standing portable holder for supporting conventional perforated paper towelling rolled on a hollow core center and means for facilitating gradual tearing off of first or outer sheets of paper towel therefrom by manual gripping of

the upper outer corner of such sheets by one hand only comprising:

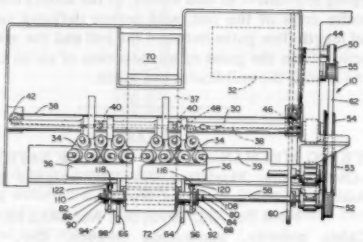
1. a pedestal base adapted to rest upon a horizontal surface;
2. a pole extending upwardly from said base having a diameter adapted to fit within the hollow core of such roll of paper towelling for supporting the latter with its axis normal to the horizontal surface upon which said base rests;
3. an annular rim on the upper surface of said base and extending upwardly a distance substantially comparable to the diameter of said pole and concentric to said pole for circumscribing the lower portion of the roll of paper towelling thereon; and
4. an internal edge on the upper end of said annular rim engageable by the lower portion of a sheet of towelling extending tangentially from said roll in a spaced relation to the line of perforations between such sheet of towelling and the roll thereof for providing a fulcrum point for engaging such sheet at a sufficient distance above said base to facilitate separation of such sheet from the roll thereof between perforations therebetween, first at the upper end of the line of perforations and gradually downward from top to bottom of such perforations by a downward pull exherted manually upon the upper outer corner of such sheet.

4,030,677

RECORD MEDIA REWIND MECHANISM

Gary A. Wojdyla, and Kenneth W. Hanna, both of Ithaca, N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 8, 1976, Ser. No. 665,036
Int. Cl.² B65H *17/08*
U.S. Cl. 242—65 **18 Claims**



1. A take-up assembly for record media comprising
frame means,
rotary drive means journaled in said frame means,
roller means adjacent said drive means for winding of said record media on said roller means by driving contact of said drive means with said record media, and
support means operably associated with said roller means and pivotally movable with respect to said frame means permitting said roller means to move from said drive means upon winding of said record media on said roller means and permitting removal of said roller means from said frame means.

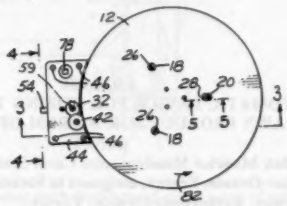
4,030,678

TAPE WINDING DEVICE

Ralph E. Simpson, 2445 N. Highland Road, Upland, Calif. 91786

Filed June 18, 1976, Ser. No. 697,433
Int. Cl.² B65H *17/02*
U.S. Cl. 242—67.2 **10 Claims**

1. Tape winding means particularly suited for the automatic winding of a pile of loose tape dumped by a computer into a relatively tight roll, said tape winding means comprising:
a flat tape deck mounted for horizontal rotation about an axis, said tape deck having three hub posts mounted equidistantly from said axis and equiangularly spaced therearound to form a hub about which said tape can be wound, at least one of said hub posts having a vertical slot sized to receive said tape so that an end of the tape can be threadedly connected to that post to permit subsequent pulling of said tape thereby; two of the three hub posts having vertical outer sides and the other post having a tape receiving outer side that slopes slightly inwardly from the vertical, towards said axis, in the upward direction;
motor means for rotating said deck about said axis at relatively fast speed;



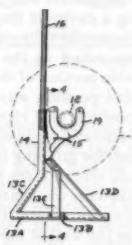
control means for turning said motor means on and off; and
tape guide and tensioning means for guiding tape disposed for winding about said hub toward that hub in proper position for the rapid formation of said roll therearound, when said motor means is turned on, while exerting sufficient pressure on the incoming tape to keep it under proper tension to ensure adequate tightness in the resulting roll;
whereby a pile of loose tape can be automatically wound around said hub to form a tight roll that can be lifted away from the hub because of the slight inward slope of the outer side of said other post.

4,030,679

STAND FOR A ROLL OF FLOOR COVERING MATERIAL

Herve Joseph Pelletier, Middlesex Road, Topsham, Maine 04086

Filed Apr. 2, 1976, Ser. No. 672,863
Int. Cl.² B65H *17/02*
U.S. Cl. 242—68 **6 Claims**



1. A stand for a roll of a floor covering material having a maximum outside diameter and provided with a core having protruding ends, said stand comprising a pair of supports, each support including a floor engaging base and an upright provided with an upwardly opening U-shaped receiver for an end of said core and located a distance above said base greater than the maximum radius of the roll, at least one end of said base being useable as a fulcrum, and each upright support also including a lever portion extending vertically relative to said base beyond said receiver a distance greater than said maximum radius and at one side of the receiver whereby said supports may have spaced apart loading positions in which

each base is supported by its fulcrum end with its receiver in a position such that on relative movement between that support and the roll, the core ends enter the receivers with the roll on the floor, the lever portions then enabling the supports to be erected with the cross rods seated in the receivers.

4,030,680

AUTOMATIC DEVICE FOR SEIZING THE END OF A DRAWN PRODUCT FOR A DRUM OF A DRAWING BENCH

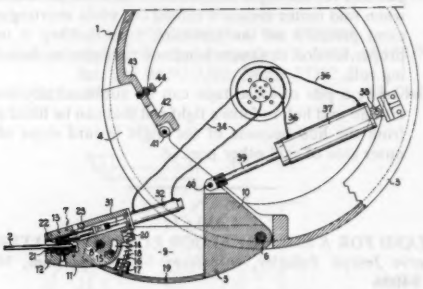
Christian Maurice Mandras, and Carol Stanik, both of Revigny-sur-Ornain, France, assignors to Societe Metallurgique de Revigny, Revigny-sur-Ornain, France

Filed Aug. 18, 1976, Ser. No. 715,582

Claims priority, application France, Aug. 20, 1975, 75.25762

Int. Cl.² B21C *17/10*

U.S. Cl. 242—78.3 **11 Claims**



1. A device for automatically seizing a drawn product end for a drum of a drawing bench, the device comprising said drum which has a peripheral wall and is rotatable about an axis, means defining a cavity in the drum wall, an elongated element pivotably mounted in the cavity and having a shape substantially corresponding to the shape of the cavity and constituting a movable portion of the drum wall and pivotable between an extended position and a withdrawn position in which withdrawn position said element is returned into said cavity so as to substantially reconstitute the wall of the drum, a gripping mechanism for gripping said product end and pivotably mounted on said element, the gripping mechanism being adapted to be substantially in alignment with said product end in said extended position of said element, said cavity being upwardly inclined in the wall of the drum, with respect to the direction of rotation of the drum, from a lower edge of the drum, said element being a cranked lever having a first arm which extends inwardly of the drum and a second arm which has an elongated shape substantially corresponding to the shape of said cavity and has a U-shaped cross-section and constitutes a fork comprising two branches and an intermediate portion which closes said cavity in said withdrawn position, said lever being pivotably mounted by a cranked portion thereof intermediate said arms in an upper end of the cavity and pivotable about an axis which is oblique with respect to said axis of the drum, the gripping mechanism being mounted between said branches of the fork at an end of the second arm remote from the first arm to pivot in the plane of the second arm.

4,030,681

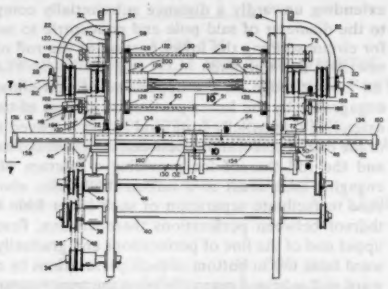
ROLL WINDER

Charles M. Schott, Jr., Gloucester, Mass., assignor to Gloucester Engineering Co. Inc., Gloucester, Mass.

Filed Mar. 2, 1976, Ser. No. 663,211

Int. Cl.² B21C *47/00*; B65H *17/02*

U.S. Cl. 242—81 **13 Claims**



1. A winder suitable for winding plastic film in the absence of a winding core comprising a pair of axially aligned arbors, one protruding from each of two opposed side supports of the winder machine, the arbors moveable axially toward each other to a winding position and moveable away axially from each other for stripping from the wound roll, and means for introducing and maintaining pressurized air at the roll-engaged support surfaces of said arbors during said outward stripping movement of said arbors, as the arbors disengage the opposite ends of the roll, said means defining substantially equal length flow paths between the roll and the arbor in each direction from the point of introduction of air to each end of the roll, until the roll leaves the arbor.

4,030,682

LOCKING MECHANISM FOR VEHICLE SAFETY BELTS

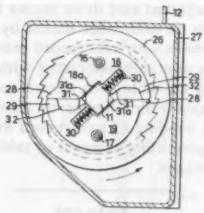
Jan-Olof Wallin, Mariefred, Sweden, assignor to Granges Essem Aktiebolag, Vasteras, Sweden

Filed Dec. 22, 1975, Ser. No. 643,116

Claims priority, application Sweden, Dec. 23, 1974, 74162637

Int. Cl.² A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 B **9 Claims**



1. A locking mechanism to be used in vehicles for retractable safety belts having a strap, the mechanism comprising: a reel having an axis and on which the strap is coiled up when not in use means biasing said reel in a belt-retraction direction; a supporting means attached to said reel for rotation with it; at least two latching means, two respective pivot pins attached to said support means said two latching means being pivotally mounted on said two respective pivot pins and positioned diametrically and symmetrically in relation to said reel and in parallel with it; each of said latching means having

substantially an identical shape and being positioned in a given plane perpendicular to said axis of said reel and in continuous abutment with each other in said plane to turn simultaneously under the influence of centrifugal force about their respective said pivot pins from a free position to a latching position; and a stop means fixed in relation to said real and positioned to engage with said at least two latching means when said at least two latching means reach their latching positions to lock said reel in the unwinding direction.

4,030,683

THREAD BRAKE FOR DOUBLE THREAD TWISTER

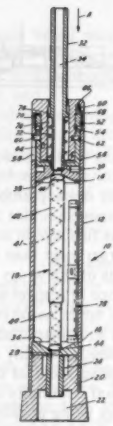
Heinrich Eckholt, Muenster, Germany, assignor to Hamel GmbH Zwirnmaschinen, Muenster, Germany

Filed Sept. 22, 1976, Ser. No. 725,494

Claims priority, application Germany, Sept. 26, 1975, 2543018

Int. Cl.² D01H *13/10*; B65H *59/06, 59/22*

U.S. Cl. 242—149 **22 Claims**



1. A thread brake comprising:

a housing defining a relatively narrow thread passage and along said passage a relatively wide compartment having a wall at said passage;

a braking element in said compartment normally lying in a braking position against said wall at said passage and displaceable laterally of said passage into a position clear of said passage, whereby a thread extending along said passage is normally pinched by said braking element against said wall;

a threading element in said housing and having an elongated relatively narrow open course, said threading element being displaceable between a position with said course out of alignment with said passage in said compartment and a threading position with said course aligned with said passage in said compartment; and

operating means for displacing said threading element from outside said housing into said threading position and for simultaneously displacing said braking element out of said braking position.

4,030,684

YARN TENSIONING DEVICE

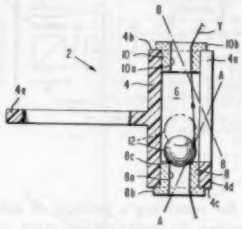
Nathan Levin, 416 Highgate Drive, Trenton, N.J. 08618

Filed July 3, 1975, Ser. No. 592,871

Int. Cl.² B65H *59/22*

U.S. Cl. 242—152.1 **7 Claims**

1. A yarn tensioning device having a housing, said housing having a yarn passageway of predetermined length extending vertically therethrough, spaced upper and lower inserts received within the upper and the lower ends of said passageway, respectively, each of said inserts an uninterrupted wall providing an uninterrupted opening extending therethrough for the passage of yarn, said lower insert being provided with an uninterrupted circularly shaped seat around its said opening, a ball received within said passageway and between said inserts in seated position upon said seat in said lower insert, the relative dimensions of said ball, of said lower insert and of



said passageway being such that lateral movement of said ball is restrained by the surface of said passageway thereby to retain said ball in its said seated position upon said lower insert, and said housing having an aperture extending therethrough in communication with said passageway, said aperture being disposed between said inserts, whereby said device may be threaded by threading the yarn in turn through said aperture and through said openings in each of said inserts.

4,030,685

MAGNETIC TAPE MAGAZINE

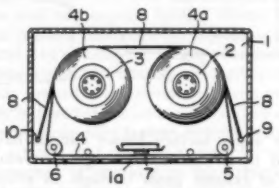
Osamu Suzuki; Goro Akashi; Akira Kasuga, and Kenji Sega, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 15, 1975, Ser. No. 605,046

Claims priority, application Japan, Aug. 16, 1974, 49-94046

Int. Cl.² G11B *23/10*

U.S. Cl. 242—199 **6 Claims**



1. A magnetic tape magazine comprising a casing, a take-up core, a feed-out core and a magnetic tape wound in convolutions on said take-up core and a feed-out core wherein the improvement comprising a flexible belt having first and second ends and being tensioned around and contacting the tape convolutions wound on said cores for exerting a pressure on the tape convolutions and mounting means for attaching said first and second ends to said casing.

4,030,686

POSITION DETERMINING SYSTEMS

William W. Buchman, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 4, 1975, Ser. No. 610,214

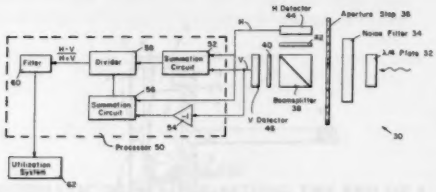
Int. Cl.² F41G *7/00, 7/18*; F42B *15/10, 15/02*

U.S. Cl. 244—3.13 **8 Claims**

1. A system for providing position signals comprising:

first means for transmitting a beam of electromagnetic energy which has encoded thereon, as a polarization state of

the energy, angular position along at least one dimension across said beam with the transition of the polarization state being from elliptical polarization of a first sense at one edge of the beam, through linear polarization, to elliptical polarization of the opposite sense at the opposite edge of the beam; and



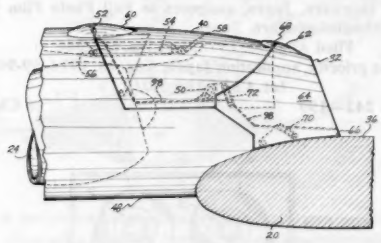
second means for receiving a portion of said transmitted energy, decoding its polarization state and providing therefrom position signals indicative of the angular position of the received energy within said beam and along said dimension.

4,030,687

ARTICULATED NOZZLE FOR UPPER SURFACE BLOWN AIRCRAFT

Donald William Hapke, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 23, 1976, Ser. No. 660,564
Int. Cl.² B64C *15/08*
U.S. Cl. 244—12.5 **2 Claims**



1. In an upper surface blown aircraft having an engine surrounded by a nacelle, the engine developing thrust by discharge of exhaust gases through an exhaust outlet and being mounted on and operationally associated with the wing of the aircraft, the exhaust outlet being so oriented to the wing so as to discharge the exhaust gases across the upper airfoil surface of the wing when the engine is in operation, the combination comprising,

a. an exhaust nozzle mounted to the nacelle positioned to receive the guide the exhaust gases from the outlet of the engine, said exhaust nozzle having an upper and lower portion;

b. a thrust reverser door;

c. first mounting means for mounting the upper portion of said exhaust nozzle to the nacelle;

d. second mounting means for mounting the thrust reverser door to the nacelle;

e. hinge means for connecting the aft portion of said reverser door to the upper portion of said exhaust nozzle;

f. connecting means for connecting the upper portion of said exhaust nozzle to the lower portion of said exhaust nozzle; and

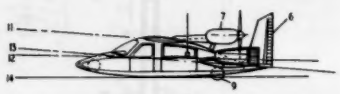
g. actuating means connected to said reverser door and said exhaust nozzle for effecting a movement of said reverser door and the upper portion of said exhaust nozzle from a first position directing the exhaust gases rearwardly when the aircraft is in cruise mode, to a second position for use in takeoff and landing wherein the upper portion of said exhaust nozzle is moved upward relative to the lower portion thereby increasing the outlet area of said exhaust nozzle, and wherein the upper portion of said exhaust nozzle and said reverser door are tilted relative to the first position thereby directing the exhaust gases rearwardly and downwardly and causing lateral spreading of the exhaust gases across the wing.

4,030,688

AIRCRAFT STRUCTURES

Luigi Pellarini, 30 Lachlan Ave., Sylvania, New South Wales 2224, Australia

Filed Feb. 18, 1975, Ser. No. 550,855
Claims priority, application Australia, Feb. 26, 1974, 6731/74
Int. Cl.² B64C *3/08*
U.S. Cl. 244—13 **9 Claims**



1. An aircraft comprising a narrow delta planform fuselage whose longitudinal section contours form low drag-high lift aerodynamic airfoils, said delta planform fuselage carrying two comparatively small span shoulder type wings at the level of the upper surface of the fuselage in tandem and in cascade, the rear wing being of larger span than the forward wing, the mean aerodynamic chords of the wings forming zero to small negative angles of incidence in respect of the zero-lift angle of incidence of the fuselage mean aerodynamic chord, the rear wing of the aircraft being so constructed that the side and top surfaces of the fuselage blend smoothly with the upper surface of the rear wing while the surfaces of the fuselage below the rear wing meet with normal continuity with the under surface of the rear wing, the wings being positioned in tandem and in cascade so as to cause generation of additional air flow momentum above the fuselage rearward of the forward wing and above the central portion of the rear wing; a twin tail located at the rear of the fuselage with a trailing edge elevator located between the twin tail and forming the trailing edge of the fuselage; the trailing edge of the rear and forward wings being substantially at right angles to the longitudinal axis of the aircraft and said delta fuselage carrying a power plant system above the upper surface of the fuselage and as far as stability requirements permit rearward in respect of the centre of gravity of the aircraft.

4,030,689

CANOPY RELEASE ACTIVATING DEVICE FOR PARACHUTES

Jose E. Rodriguez, 6107 A Yadkin Road, Fayetteville, N.C. 28303

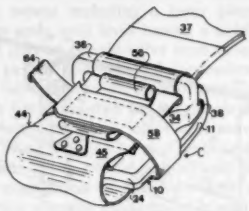
Filed Feb. 9, 1976, Ser. No. 656,744
Int. Cl.² B64D *17/38*
U.S. Cl. 244—151 B **5 Claims**

1. An activating device for parachute canopy release systems of the type wherein a male fitting is suspended from a canopy riser and includes a heel and nose portion which are received respectively within a corresponding recess and beneath a metallic slider member of a female fitting, which in turn is attached to the chute harness, said activating device comprising:

a. at least one fabric strip of a length sufficient to be threaded through the under portion of said female fitting with both ends wrapping around and substantially over the assemblage of said male and female fittings, and also having end portions overlapping each other;

b. a bracket means secured to said fabric strip and pivotally attached to said female fitting in operative engagement with said slider;

c. said bracket means being movable between a first locking position wherein said slider overlies a portion of said male fitting in its assembled position within said female fitting, and a second release position wherein said slider is removed from its overlying position atop the male fitting,



said bracket means being moved from said first to said second position by a downward movement of the lower end of said fabric strip, whereby said riser and canopy are thereby released; and

d. quick release fabric fastening means for holding said lower end in a first, upper locking position overlapping the upper end of said strip until it is desired to release said canopy, whereupon said lower end is released and pulled downwardly away from said upper end.

4,030,690

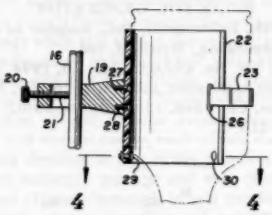
MEDICAL EQUIPMENT DEVICE FOR CONTROLLING DISPOSITIONS OF INTRAVENOUS BOTTLES

Burton C. Hanauer, Avon, and Charles Richard Patton, Bloomington, both of Minn., assignors to Hanauer Machine Works Incorporated, Avon, Minn.

Continuation-in-part of Ser. No. 515,438, Oct. 16, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 644,833

Int. Cl.² A47K *1/08*

U.S. Cl. 248—311.3 **3 Claims**



1. Intravenous bottle retaining means comprising

a. a support bracket means having pole gripping means at the inner end thereof and an intravenous bottle receiver at the outer end thereof;

b. said intravenous bottle receiver comprising an open-ended generally radially flexible split sleeve consisting essentially of resilient rubber material and having means securing said split sleeve to the outer end of said support bracket means, three substantially equally arcuately spaced apart radially inwardly extending hemispherical projections of small diameter disposed adjacent the bottom edge of said split sleeve for engaging and releasably supporting an intravenous bottle in inverted upright disposition within said split sleeve and generally above said projections; and

c. strap means arranged for releasable securing to opposed free edges of said split sleeve for releasably drawing said opposed free edges arcuately toward each other.

4,030,691

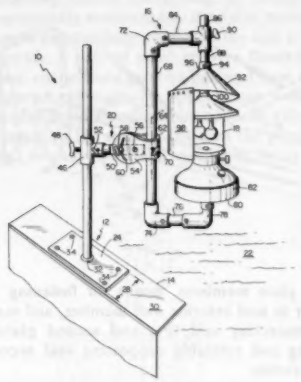
NIGHT FISHING RIG

John F. Fleshman, 680 Golden Gate Pt., Sarasota, Fla. 33577

Filed July 16, 1976, Ser. No. 706,042

Int. Cl.² A47B *73/00, 23/00*

U.S. Cl. 248—225.3 **5 Claims**



1. An apparatus for a boat to support a lantern over the water for night fishing comprising:

boat mounting means including: an opposed plurality of pressure plates associating with said boat and compressing a surface of said boat therebetween whereby a detachably fixed and rigid relationship is provided between said mounting means and said boat; and a removably attached vertical tube of extended length;

lantern holding means including: a circular platform providing support and lateral constraint for said lantern; a cap for resting atop said lantern and vertically constraining said lantern, the displacement between said platform and said cap being adjustably fixed to accommodate individually a plurality of lanterns of different sizes; and

support means to adjustably join together said boat mounting means and said lantern holding means including: a sliding and rotating connector for adjustably attaching to said vertical tube of extended length whereby said lantern holding means may be vertically elevated or lowered and horizontally rotated; a horizontal extension rotatably and detachably fastened at one end to said sliding and rotating connector whereby said lantern holding means may be vertically rotated; and pivoting means pivotally and adjustably attached at one side to the other end of said horizontal extension and, at the other side, slidably and adjustably fastened to said lantern holding means whereby said lantern holding means may be pivoted and translated relative to said vertical tube of extended length.

4,030,692

MIRROR MOUNTING STRUCTURE

Jane M. Szilagyi, Center Valley, Pa., assignor to Delbar Products, Inc., Perkasie, Pa.

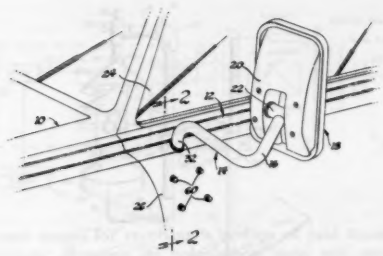
Continuation-in-part of Ser. No. 586,334, June 6, 1975, abandoned. This application June 4, 1976, Ser. No. 693,028

Int. Cl.² A47G *1/12*; **B60R** *1/06*

U.S. Cl. 248—487 **11 Claims**

1. An outside rear view mirror assembly adapted to be mounted to a body portion of a vehicle and which body portion includes an exterior wall member defining one side of a chamber within the vehicle body, an opening in said wall member and communicating with said chamber, said assembly comprising a mirror head, a support arm adapted to be mounted upon said exterior wall, member said support arm including a first leg portion disposed exteriorly of the vehicle

body, means for adjustably supporting the mirror head upon said first leg portion, said supporting arm including a second leg portion extending through said wall opening and projecting within said body chamber, bracket means disposed within said body chamber, said bracket means including first and



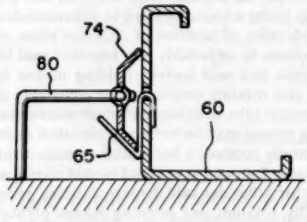
second plate members, means for fastening said first plate member to said exterior wall member, and means for adjustably connecting said first and second plate members for clamping and rotatably supporting said second leg portion therebetween.

4,030,693

LONGITUDINAL JOINT ASSEMBLY IN COMBINATION WITH A PAVING FORM

Walter Frederick Kinnucan, Jr., 140 Blackstone, LaGrange, Ill. 60525

Filed Feb. 11, 1976, Ser. No. 657,086
Int. Cl.² E01C *19/50*
U.S. Cl. 249—9 **8 Claims**



1. The combination of a paving form and:

a plurality of hangers, each having a straight connector portion, a support-holder portion extending from one end of the connector portion, and an attaching portion extending from the other end of the connector portion attaching each hanger to the form so that the support-holder portion extends at an acute angle relative to the connector portion:

a longitudinal joint, having a base portion and a pair of side walls, the longitudinal joint being positioned against the form with the base portion spaced from and substantially parallel to the form, one side wall of the longitudinal joint being received in the acute angle defined by each hanger connector and support-holder portions, both to support the joint vertically and restrain the joint from horizontal displacement away from the form, which joint also defines a plurality of concave-convex apertures for receiving a cylindrical tie bar along the axis of the longitudinal joint; and

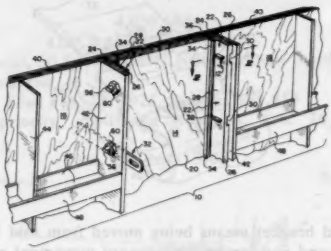
a plurality of tie bars, each having a first end portion and a second end portion extending at right angles to the first end portion, with the second end portion inserted through one of the concave-convex apertures of the joint into the space between the form and the joint.

4,030,694

COMPOSITE CONCRETE WALL FORM UNIT WITH A SPECIAL TRANSITION BOLT

Vernon R. Schimmel, Arlington Heights, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed July 14, 1976, Ser. No. 705,086
Int. Cl.² E04G *9/04, 17/04, 11/08*
U.S. Cl. 249—196 **12 Claims**



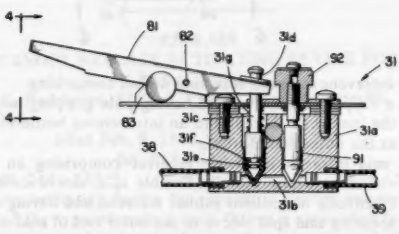
1. In a concrete wall form, a composite fill-in panel unit comprising three rectangular upstanding metal-clad panels arranged in edge-to-edge relationship and including a medial panel and a pair of outside panels, each of said panels embodying a rectangular facing and a rectangular reinforcing frame including opposed parallel vertical side rails, the side rails of said panels being provided with vertically spaced pairs of opposed bolt-receiving openings at different horizontal levels, the side rails of adjacent panels abutting each other, fastening bolts projecting through registering openings in the side rails of abutting panels, and reaction members associated with said fastening bolts for drawing such abutting panels hard against each other, the facings of said outside panels being embodied in a single continuous sheet which bridges the facing of the medial panel and lies flat against the same in face-to-face coextensive relationship and constitutes, in effect, a common and complete facing for the three panels.

4,030,695

PULSE FOG GENERATOR

Russell R. Curtis, Indianapolis, Ind., assignor to Curtis Dyna Products Corporation, Westfield, Ind.

Division of Ser. No. 492,035, July 26, 1974, Pat. No. 3,993,582. This application Jan. 21, 1976, Ser. No. 650,860
Int. Cl.² F16K *13/00, 25/00, 35/02*
U.S. Cl. 251—113 **2 Claims**



1. A control valve for controlling the flow of fog-producing fluid to a pulse fog generator, said control valve including a housing having a rectilinear fluid flow passage which is circular in cross-section extending through the housing, a valve member supported in said housing for adjustable movement transverse to said passage, a conical cavity formed in said housing whose longitudinal axis intersects the centerline of said passage and the junction of said passage and cavity lies wholly upon the inclined side surface of the conical cavity, said valve member including a stem slidable within a bore in

said valve body and extending from the valve housing, a valve closure element carried by said stem and unitarily molded of an elastomeric material, said closure element having a conical configuration closely fitting said conical cavity and thus blocking said passage when said stem is in one limiting position, an integral generally annular collar on said closure element spaced above the conical portion thereof and engaging said bore to provide a dynamic seal for said stem, actuating means for moving said stem into and out of said one limiting position, said actuating means including a lever pivotally mounted intermediate its ends, said lever having a unidirectional connection to said portion of said valve stem extending from the valve housing, so that upon manual depression of one end of said lever said valve stem is lifted out of said passage blocking position, and a pin supported for longitudinally axial movement transverse to the plane of pivotal movement of said lever, said pin being engaged by said lever and positioned on the opposite side of the pivotal axis of said lever from said unidirectional connection of the lever and said extending valve stem portion whereby engagement of said lever with said pin limits the pivotal movement of said lever in valve stem lifting direction, said pin carrying a radially extending abutment which, when engaging said lever, prevents pivotal motion of the lever, a coiled spring encircling said pin and exerting an axially directed biasing force thereon urging said pin into a position in which said abutment engages said lever and prevents pivotal motion thereof, one end of said spring extending rectilinearly into abutting relation to said lever, whereby said spring is stressed in compression when said pin is axially moved to disengage said abutment from said lever and is stressed in torsion when subsequently said lever is pivotally moved in valve stem lifting direction.

2. A control valve for controlling the flow of fog-producing fluid to a pulse fog generator, said control valve including a housing having a rectilinear fluid flow passage which is circular in cross-section extending through the housing, a valve member supported in said housing for adjustable movement transverse to said passage, a conical cavity formed in said housing whose longitudinal axis intersects the centerline of said passage and the junction of said passage and cavity lies wholly upon the inclined side surface of the conical cavity, said valve member including a stem slidable within a bore in said valve body and extending from the valve housing, a valve closure element carried by said stem and unitarily molded of an elastomeric material, said closure element having a conical configuration closely fitting said conical cavity and thus blocking said passage when said stem is in one limiting position, said conically configurated portion of said valve closure element being provided with two diametrically opposite flattened portions each having a surface area larger than the area enclosed by the junction of said circular cross-sectioned fluid flow passage and said conical cavity, each of said flattened surface portions being disposed at one of the junctions between said circular cross-sectioned passage and said conical cavity, so that when said closure element is in said one limiting position said cavity and passage junctions are not engaged by said closure element, and an integral generally annular collar on said closure element spaced above the conical portion thereof and engaging said bore to provide a dynamic seal for said stem, and actuating means for moving said stem into and out of said one limiting position.

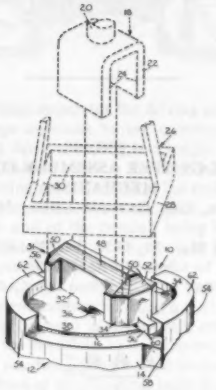
4,030,696

VALVE POSITIONING HANDLE

Earl A. Bake, Pittsburgh, and E. Frederick Schoeneweis, Coraopolis, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 636,844, Dec. 2, 1975, abandoned. This application May 25, 1976, Ser. No. 690,201
Int. Cl.² F16K *51/00*
U.S. Cl. 251—288 **3 Claims**

1. A valve positioning handle for operating a valve means having a central axis, a body and a valve member disposed within the body for rotation about the axis by selective use of either of a pair of torque applying tools, which pair of torque applying tools includes an inverted U-shaped wrench having a pair of parallel legs and a square shaped wrench having four mutually perpendicularly disposed parallel side legs aligned to make contact with an upper surface of the body when the square shaped wrench is used on the valve positioning handle, said valve positioning handle comprising: an elongated extended fitting operatively connected to the valve member and extending in length substantially normal to the axis in coaxial alignment therewith; a pair of axial grooves formed in the sides of the fitting, each of said grooves having a base wall and longitudinally spaced end walls, the spaced base walls of the grooves being equally radially spaced on opposite sides of the axis a distance equal to the spacing between the parallel legs of said U-shaped wrench, with the end walls being spaced



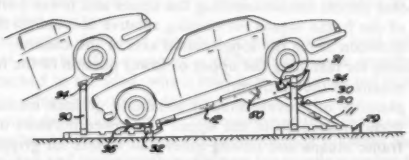
substantially the length of said legs whereby the legs may be slidably axially received in said grooves; a quadruplet of side walls formed on the ends of the fittings radially outward of the grooves parallel to and equally radially spaced with respect to the axis, said side walls oriented oblique to and radially outward of the grooves, said side walls defining equally circumferentially spaced surfaces for exteriorally slidably receiving the legs of said square shaped wrench; and a pair of tabs extending longitudinally from said fitting to be aligned with vertical surfaces on said body for contact therewith to limit the degree of rotation of said fluid isolation means within said body, said tabs being axially located below said upper surface of said body to prevent contact of said tabs by said square shaped wrench when said square shaped wrench is used on said valve positioning handle.

4,030,697

VEHICLE JACKS

Christopher Thomas Robinson, c/o Sir Thomas Robinson & Son (Grimsby) Ltd., Wharncliffe Road, Fish Docks, Grimsby, DN31 3QQ, Lincolnshire, England

Filed June 23, 1975, Ser. No. 589,779
Int. Cl.² B66F *11/00*
U.S. Cl. 254—8 R **9 Claims**



1. A jack member for use in raising and lowering a vehicle to and from a position inclined to the horizontal, the jack

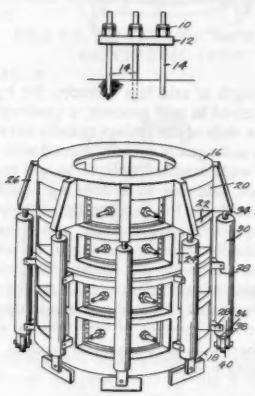
member comprising an elongate approach ramp, an elongate lifting ramp, pivoting means extending transversely of the longitudinal axes of said ramps, whereby said ramps are connected together adjacent one of their ends, a pressure fluid ram pivotally connected to the ramps to rotate said lifting ramp with respect to said approach ramp from a first position to a second position, said lifting ramp including a surface defining a track along which track a vehicle wheel can run when the jack member is in its first position, support means provided at the said one end of said lifting ram, to receive means for cradling said vehicle wheel, and means allowing said wheel cradling means to come into supporting engagement with said vehicle wheel then said pressure fluid ram has rotated said lifting ramp from said first position, in which said vehicle wheel runs along said ramps, into said second position in which the said one ends of said ramps are raised above their other ends.

4,030,698

RELEASABLE GRIPPER ASSEMBLY FOR A JACKING MECHANISM

John H. Hansen, One Granada Circle, Mount Sinai, N.Y. 11766

Filed Mar. 31, 1976, Ser. No. 672,628
Int. Cl.² B66F *1/08*
U.S. Cl. 254—106 **15 Claims**



1. A jack assembly for releasably securing a platform or the like to a cylindrical caisson or the like, for relative linear movement of the platform in either direction axially of the caisson, comprising:

frame means for encompassing a longitudinal outer surface portion of the caisson, and having upper and lower relatively movable portions;

motor means interconnecting the upper and lower portions of the frame means for causing relative movement therebetween along the longitudinal axis of the caisson;

means for fastening the upper or lower portion of the frame means to the platform;

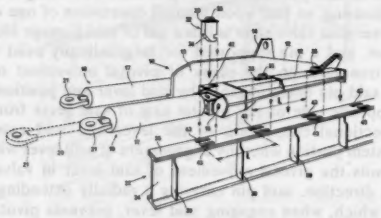
a plurality of arcuate-shaped inflatable gripper means releasably secured to the upper and lower portions of the frame means and having inner pad means for grippingly engaging the outer surface of the caisson when the gripper means is inflated, each gripper means being removably replaceable in the frame means without removing the frame means from the caisson.

4,030,699

HANDLING DEVICE FOR SHIFTING HEAVY LOADS ALONG A SLIDING TRACK

Wolfram Heimke, Chemin les Goules Antibes, France, assignor to Union Industrielle et D'Entreprise, Paris, France

Filed Jan. 5, 1976, Ser. No. 646,612
Claims priority, application France, May 2, 1975, 75.13814
Int. Cl.² B65G *7/00*
U.S. Cl. 254—108 **5 Claims**



1. A device for shifting a heavy load by slidingly displacing the same along a sliding track, comprising at least one movable platform provided with double acting hydraulic jacks the respective piston rods of which are connected to said load, said platform resting, through the intermediary of a supporting element, on a guiding rail associated to said track, locking means for locking said platform on said rail, said locking means comprising at least one catching element, mounted in a vertical shaft provided in said platform, so as to be vertically movable in said shaft between a lower position wherein a portion of said catching element projects from the lower surface of said supporting element, and a raised position wherein said catching element does substantially not project from said lower surface of said supporting element, said catching element having a general configuration of a prism with a rectangular base and being provided at its upper end with an integral plate the periphery of which protrudes over the periphery of said prism, and which is provided with a handle, said rail being provided with a plurality of regularly spaced rail apertures distributed over the length of said rail and adapted to receive said projecting portion of said catching element when the latter is in said lowered position, said projecting portion being provided at its front end, with reference to the direction of displacement of said load, with an oblique surface forming a sliding ramp adapted to cooperate with the front edge of any one of said rail apertures, and said projecting portion further being provided at its rear end with a locking surface adapted to cooperate with the rear edge of any one said rail apertures.

4,030,700

MANUALLY OPERATED LOG BREAKING DEVICE

Victor A. Dushku, c/o Borden, Studentstaden 2, 75233 Uppsala, Sweden

Filed July 19, 1976, Ser. No. 706,379
Claims priority, application United Kingdom, Aug. 29, 1975, 35810/75
Int. Cl.² B66F *15/00*
U.S. Cl. 254—113 **8 Claims**

1. A manually operated mechanical log breaking device comprising

a longitudinal extending lever member;

a first pressure plate extending from one end portion of said lever member;

a second pressure plate joined to said first pressure plate in a hinged relationship;

a third pressure plate;

a link system interconnecting said third plate and said first

and second plates with said third plate spaced from said first and second plates,

said link system comprising an axle and three lever members, one end of each of said

members being hingedly connected to said axle, said members extending from said axle and being hingedly connected to said first, second and third pressure plates respectively.

4,030,701

PNEUMATIC VEHICLE JACK

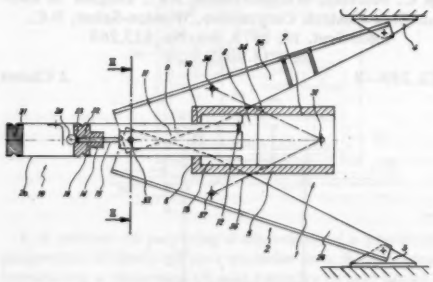
Pierre Joseph Pingon, 7 avenue du Parmelan, 74 Annecy (Haute Savoie), France

Filed Apr. 6, 1976, Ser. No. 674,736

Claims priority, application France, Apr. 11, 1975, 75.11343; Dec. 12, 1975, 75.38064

Int. Cl.² B66F *3/24*

U.S. Cl. 254—124 **9 Claims**



1. A pneumatic vehicle jack comprising a pneumatic jack cylinder made of relatively movable parts and having a pressure chamber, a cartridge of compressed air having a limited volume, means for connecting the interior of said cartridge with said pressure chamber of said jack cylinder, whereby the force exerted by said jack cylinder is progressively reduced when the volume of said pressure chamber increases during the operation of said jack, and a lever system connected to said movable parts of said jack cylinder and acting between the ground and the vehicle to be lifted, said lever system comprising levers so disposed as to reduce the force exerted by the jack cylinder at the beginning stage of the jack operation and for multiplying said force during the last stage of the said operation, so that a substantially constant lifting force is provided by said vehicle jack.

4,030,702

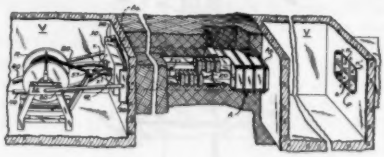
APPARATUS AND METHOD FOR PNEUMATICALLY RODDING MULTI-PASSAGE CABLE HOUSING CONDUITS

William P. Ware, Charlotte, N.C., and Robert D. Wheeler, Rock Hill, S.C., assignors to Thomas Industries of Tennessee, Inc., Matthews, N.C.

Filed Aug. 26, 1976, Ser. No. 718,013

Int. Cl.² B65H *59/00*

U.S. Cl. 254—134.4 **14 Claims**



1. Pneumatic rodding apparatus for driving cable pull lines through multi-passage conduits having communicating gaps between passages at intervals along the length thereof, said apparatus including shaped carriers for insertion within each said passages and having means to which the end of cable pull lines are attached, a manifold for closing the entrant end of the conduit, the exit end of the conduit being left open, the manifold having a first set of openings which communicate with said conduit passages and a further set of smaller sized openings through which the pull lines feed to the first set of openings, a stand for rotatably supporting a reel on which the pull lines are uniformly wound in side by side relation, means for blowing air into the manifold to simultaneously drive the carriers through the conduit passages, and braking means for tensioning the pull lines as they unwind from the reel so that the carriers advance in unison as they are driven through the conduit passages to the exit end of the conduit.

4,030,703

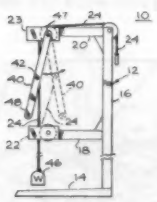
SIMPLE MACHINE

Henry M. Bissell, 6321 Riggs Place, Los Angeles, Calif. 90045

Filed Nov. 22, 1974, Ser. No. 526,256

Int. Cl.² B66D *1/00*

U.S. Cl. 254—135 R **25 Claims**



1. A mechanism for pulling a load comprising:

at least one load support member;

means for readily securing the load support member in a selected position;

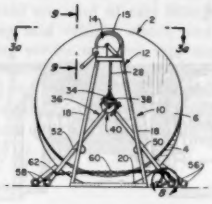
a unidirectional motion member coupled to the load support member for engaging a deflectible tensile member attached to the load, which load is to be connected adjacent a free end of said tensile member; and

a pivoted deflection member for bearing against the tensile member between the unidirectional motion member and the load and transversely deflecting the tensile member to pull the load relative to the support member by successive increments as the slack in the tensile member is taken up through the unidirectional motion member.

4,030,704
WIRE OR CABLE REEL SUPPORT

Carl Beierle, 12613 Brooklake St., Los Angeles, Calif. 90066, and Harry Irik, 2025 Ashland Ave., Santa Monica, Calif. 90405

Filed July 25, 1975, Ser. No. 599,045
Int. Cl.² B66C 23/60
U.S. Cl. 254—139.1 16 Claims

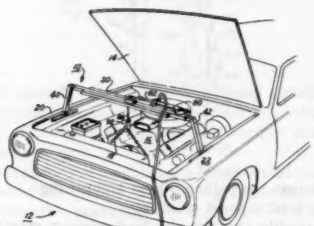


1. A reel lift and support for lifting and supporting a reel of cable or the like to permit unwinding of cable or the like therefrom, comprising: means for sequentially lifting one end of said reel for placement of a support member, as hereinafter defined, on each side of said reel; a slideably disposable horizontal support means adapted for use in lifting and supporting said reel and adapted for releasable cooperative association with said reel; a pair of support members for positioning on each side of said reel and adapted to be cooperatively, supportingly and releasably associated with said horizontal support means, said pair of support members, each comprising a support block to receive said horizontal support means in supportive relationship, a first elongate leg member, fixedly secured to said support block and a second, spaced, elongate leg member pivotally secured to said support block for movement towards and away from said first elongate leg member, said first and second elongate leg members lying in the same plane; and retaining means for selectively positioning and retaining said second elongate leg member with respect to said first elongate leg member, whereby said pair of support members support said reel in elevation to permit rotation thereof.

4,030,705
VEHICLE SUPPORTED MOTOR LIFT

Jacob Bontrager, 809 3rd Ave. NE., Jamestown, N. Dak. 58401

Filed Jan. 19, 1976, Ser. No. 649,917
Int. Cl.² B66C 23/60
U.S. Cl. 254—139.1 12 Claims



1. A lift for the motor of a vehicle having lateral longitudinal side structures defining a motor compartment, comprising a generally horizontally disposed beam for mounting above the motor in a transverse position, leg means connected to each end of said beam for supporting the beam on the two lateral side structures of the motor compartment above the motor therein and including means at the bottom for seating on compartment side structures and holding said beam in an elevated position, a lift mechanism on said transversely positioned beam having a means for connecting the lift mechanism to the vehicle motor, a power operated means for raising said connecting means to lift the vehicle motor, and a means for controlling the operation of said power means.

4,030,706
HIGHWAY GUARD RAIL BUMPER GUARD

James S. Ward, Stratford, Conn., assignor to James S. Ward, Stratford, Conn.

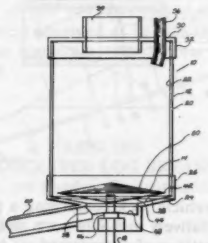
Filed Sept. 8, 1976, Ser. No. 721,465
Int. Cl.² E04H 17/00
U.S. Cl. 256—1 6 Claims

1. A highway guard rail bumper guard comprising:
at least two vehicle tires arranged concentrically one within the other, each of said tires having a minor circumferential segment thereof removed to thereby provide spaced ends on each said tire;
fastening elements carried by the outermost of said tires adjacent each of the ends thereof;
clamping means connected between said fastening elements; and
an annularly extending layer of a particulate incompressible material disposed within the innermost of said tires.

4,030,707
BLENDER

George C. Moreton, Winston-Salem, N.C., assignor to Electronic Data Controls Corporation, Winston-Salem, N.C.

Filed Sept. 15, 1975, Ser. No. 613,269
Int. Cl.² B01F 7/26
U.S. Cl. 259—8 2 Claims



1. A blender for blending liquids, liquids and powders, or similar products comprising a bowl having a generally upstanding cylindrical side wall and a bottom wall, a blending disc mounted in said bowl for rotation about a generally vertical axis coaxial with the cylindrical side wall of said bowl, said disc having a generally circular periphery closely adjacent, said cylindrical side wall and an undersurface closely adjacent the bottom wall of said bowl, said bowl having means for

receiving product components above said disc and a discharge port in said bottom wall below said disc for discharge of blended product therethrough, and means for rotating said disc to effect blending of said product components and to create a centrifugal draft at the disc periphery and undersurface, said disc periphery and undersurface being sufficiently close to said bowl side wall and bottom wall to prevent product flow therepast during said centrifugal draft created by the rotating disc while being spaced sufficiently therefrom to permit product flow therepast to said discharge port when said disc is not rotating, the uppersurface of said disc being inclined upwardly and outwardly from a depressed central portion to direct the product centrifugally upward during rotation of said disc, said disc having a port extending therethrough from said depressed central portion downwardly to the undersurface thereof.

4,030,708

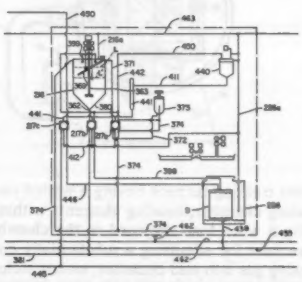
PROCESS FOR INTRODUCING PARTICULATE MATERIAL INTO A CONTAINER

Arthur J. Stock, Lakewood; Donald E. Christofer, Willowick, and Joseph E. Brinza, Euclid, all of Ohio, assignors to Stock Equipment Company, Cleveland, Ohio

Division of Ser. No. 409,386, Oct. 25, 1973, Pat. No. 3,966,175, which is a division of Ser. No. 182,088, Sept. 20, 1971, Pat. No. 3,835,617. This application Mar. 24, 1976, Ser. No. 669,906

Int. Cl.² B01F 3/12

U.S. Cl. 259—8 **13 Claims**



1. A process of preparing a dispersion of a predetermined proportion of finely divided particles in a liquid comprising introducing a dispersion of said particles in said liquid into a container; allowing said dispersion to settle so that in the container there is a first level of a mixture and above said first level a second level of a liquid that is essentially free of said particles and of a specific gravity less than the specific gravity of the mixture of particles and liquid that has settled; sensing the vertical height location of said first level of said mixture of particles and liquid in said container, sensing the vertical height location of said second level of said liquid in said container; adjusting the amount of the liquid in said container by removing liquid between said first and second levels in accordance with the sensed heights of said first and second levels to achieve a desired proportion of total liquid to total particles in said container; and mixing the resulting mixture of particles and liquid to provide a dispersion of a predetermined proportion of said finely divided particles in said liquid to be stored in a second container.

4,030,709

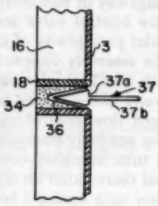
METHOD OF PLUGGING TAPHOLES IN PHOSPHORUS FURNACES

E. Dwayne Shepard, and Gordon H. Scherbel, both of Pocatello, Idaho, assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 4, 1976, Ser. No. 663,845

Int. Cl.² C21B 7/12

U.S. Cl. 266—45 **4 Claims**



1. A method of plugging tapholes in a phosphorus furnace comprising the steps:

a. providing a hollow plug member having walls of matted refractory ceramic fibers and conforming generally, at its point of contact, to the opening of the taphole, said member containing at least one hollow end and adapted to receive a supportive backing plug through said hollow end;

b. placing the hollow plug member over a rigid, heat resistant supportive backing plug adapted to make contact with the inner surface of the hollow plug member;

c. inserting the hollow plug member while mounted on the supportive backing plug into the taphole and applying sufficient force to effect a seal between the outer walls of said hollow plug member and taphole opening;

d. retaining the backing plug in place until sufficient molten furnace material solidifies against the the hollow plug member thereby plugging the taphole, and

e. removing the backing plug.

4,030,710

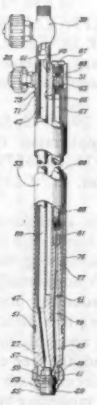
FLOATING TUBE TORCH

Larry R. Turney, Denton, Tex., assignor to Victor Equipment Company, Denton, Tex.

Filed Nov. 28, 1975, Ser. No. 636,072

Int. Cl.² B23K 7/02

U.S. Cl. 266—48 **4 Claims**



1. A cutting torch that obviates the tendency to bow because of unequal heating of tubes therewithin comprising:

a. a torch head;
b. a torch tip connected in fluid tight relationship with said torch head;
c. a body having a first passageway adapted to conformingly receive a pre-heat tube assembly and a second passageway adapted to conformingly receive a cutting oxygen tube assembly; said body having a fuel inlet passageway and an oxygen inlet passageway;
d. a barrel connected with said body;
e. a fuel flow control valve sealingly connected with said fuel inlet passageway of said body;
f. an oxygen flow control valve sealingly connected with said oxygen inlet passageway of said body;
g. a pre-heat tube assembly disposed within said barrel and connected with said fuel inlet passageway and said fuel flow control valve and with said oxygen inlet passageway and said oxygen flow control valve; said pre-heat tube assembly being sealingly connected to said torch head; said pre-heat tube assembly comprising an outer tube having inserted therewithin an injector tube and a mixer tube; said mixer tube having a bore traversing longitudinally thereof with its entrance adjacent the downstream end of said injector tube; said injector tube having a mixer at its downstream end, means spacing said mixer at a predetermined distance from entrance of said bore of said mixer tube, and at its upstream end a slidable gas separator for allowing expansion and contraction without varying said predetermined distance;
h. a cutting oxygen flow control valve;
i. a cutting oxygen tube assembly sealingly connected with said torch head and said cutting oxygen flow control valve; and
j. said pre-heat tube assembly and said cutting oxygen tube assembly being disposed in side by side relationship; only one of said outer tube of said pre-heat tube assembly and said cutting oxygen tube assembly being sealingly and rigidly connected to said body and the other thereof slidably engaging said body so as to permit body movement longitudinally thereof to compensate for periodic differential expansion between the slowly cooled pre-heat tube assembly with its slow flow of oxygen and fuel therewithin and the more rapidly cooled cutting oxygen tube assembly with its periodic rapid flow of cutting oxygen therethrough and thereby preventing periodically altering the angle of said torch head and tip with respect to said barrel and body.

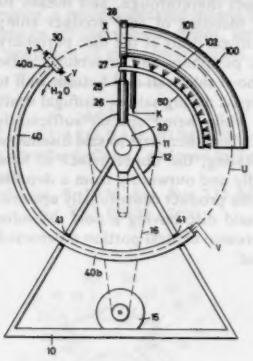
4,030,711

METHOD AND APPARATUS FOR THE SURFACE HARDENING OF THE INNER SURFACE OF TUBE BENDS

Vinzenz Siller, Hamburg, Germany, assignor to Esser-Werke GmbH vorm. Westmontan-Werke, Warstein, Sauerland, Germany

Filed May 29, 1975, Ser. No. 581,746
Claims priority, application Germany, May 31, 1974, 2426580; May 31, 1974, 2426579; Aug. 10, 1974, 2438558
Int. Cl.² C21D *9/08*
U.S. Cl. 266—123 **12 Claims**

1. An apparatus for continuously surface hardening the inner surface of tube bends of a constant radius of curvature by means of flame hardening, said apparatus comprising a support frame, a shaft horizontally journalled in the support frame, at least one mounting bracket assembly mounted on the shaft and extending in a direction perpendicular thereof, the mounting bracket assembly including means for fastening a tube bend at one end, the free end of the mounting bracket assembly defining a circular path during rotary movement of the shaft, a stationary mounting bracket connected at one end to the support frame and mounting at its opposite end a flame hardening burner, the flame hardening burner adapted to be received within the internal cavity of the tube bend, the stationary mounting bracket adapted to include the supply lines leading to the flame hardening burner and being of an arcuate



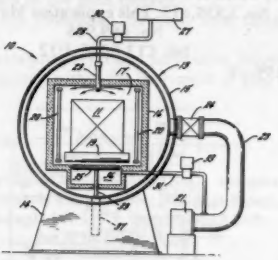
configuration of a radius corresponding to the radius of the circular path described by the tube bend during its movement.

4,030,712

METHOD AND APPARATUS FOR CIRCULATING A HEAT TREATING GAS

Ronald D. Rogers, Rockford, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Feb. 5, 1975, Ser. No. 547,107
Int. Cl.² C21D *1/74*
U.S. Cl. 266—252 **7 Claims**



1. A heat treating furnace having a walled enclosure defining a heating chamber, heating elements within the chamber for heating a work load disposed in the chamber, means including an inlet for admitting a substantially continuous flow of processing gas into said chamber, means including an outlet for exhausting a substantially continuous flow of gas from said chamber, and power-operated means for repeatedly increasing and decreasing the effective volume of said chamber and for imparting a back and forth pulsating motion to the gas while the gas is within said chamber and is flowing from said inlet to said outlet thereby to circulate the gas back and forth within the chamber and past the work load with a pulsating action as the gas flows from said inlet to said outlet.

4,030,713

VEHICLE SUSPENSION DEVICE

Dale A. Palmer, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Filed Jan. 20, 1975, Ser. No. 542,618
Int. Cl.² F16F *13/00*
U.S. Cl. 267—8 R **7 Claims**

1. A vehicle suspension device comprising,
a telescopic shock absorber including an elongated tubular housing,

a piston reciprocally disposed within said housing and connected to one end of a piston rod extending axially outwardly from one end of said housing,

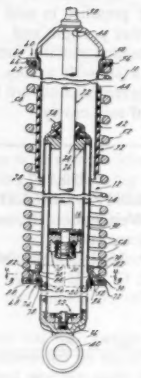
attachment means on the outer end of said piston rod and one end of said housing for securing said device to the sprung and upsprung portions of an associated vehicle,

a tubular dirt shield supported on said one end of said piston rod and extending coaxially of said rod and said housing,

said dirt shield being larger in diameter than said housing and adpated to telescopically receive the adjacent end of said housing therewithin,

said dirt shield including a generally tubular-shaped dirt shield member and a cap secured to said piston rod and said dirt shield member, said dirt shield member being formed with a radially outwardly extending shoulder adapted to operatively support one of said spring support means,

a helical coil spring extending coaxially of said housing and



said dirt shield, with said dirt shield being disposed substantially entirely within said coil spring, and

first and second spring support means for operatively supporting said spring on said shock absorber,

one of said spring support means comprising an annular spring engaging member having an axially extending portion arranged coaxially of said shock absorber and a radially outwardly extending flange portion and adapted to have one axial end of said spring bear thereagainst, said one support means also comprising first and second circumferentially extending members disposed at least in part between the outer periphery of said shock absorber and the inner periphery of said axial portion of said spring engaging member, said circumferentially extending members each having radially outwardly projecting areas adapted to nestingly receive a radially outwardly projecting portion on said shock absorber and thereby at least in part support said annular member upon said shock absorber.

4,030,714

CONNECTING ELEMENT FOR WHEEL SUSPENSIONS OF MOTOR VEHICLES

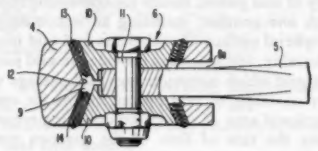
Einhard Kleinschmit, Esslingen-Hegensberg; Peter Tattermusch, Obersulm, and Günther Haverbeck, Plochingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed June 21, 1976, Ser. No. 698,081

Claims priority, application Germany, June 20, 1975, 2527408

Int. Cl.² B66G *11/24*

U.S. Cl. 267—21 A **10 Claims**



1. An elastic connecting element between a cross guide member and a support rod of a subdivided triangular guide means of a vehicle, the support rod being disposed to the rear of the cross guide member as viewed in the vehicle longitudinal direction, and connecting pin means including two clamping cone means and a clamping bolt, said clamping bolt extending through the clamping cone means as well as through the end portion of the support rod and clamping the clamping cone means by way of corresponding elastic intermediae members of at least approximately corresponding conical shape in a mounting aperture provided in the cross guide member and substantially shaped corresponding to the clamping cone means, the support rod projecting into said mounting aperture by way of a lateral opening provided in the cross guide member.

4,030,715

PNEUMATIC SHOCK ABSORBER FOR SUSPENSION OF CARS AND/OR SIMILAR VEHICLES

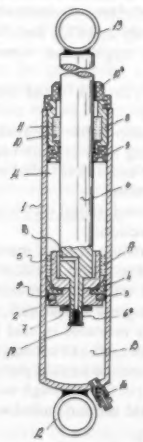
Hector Oscar Duran, Moreto Street 678, Buenos Aires, Argentina

Filed July 9, 1975, Ser. No. 594,262

Claims priority, application Argentina, Aug. 1, 1974, 255022

Int. Cl.² B60G *11/26*

U.S. Cl. 267—64 R **8 Claims**



1. A pneumatic shock absorber for use in a suspension

comprising, in combination, an elongated housing having a longitudinal axis and an internal surface bounding an enclosed space for a gaseous medium; a piston accommodated in said space for reciprocation axially of said housing and subdividing said space into two chambers, said piston having a peripheral surface juxtaposed with said internal surface of said housing; a piston stem connected to said piston and passing through one of said chambers and through said housing coaxially therewith to the exterior of said housing; means for so connecting said housing and said piston stem, respectively, to different relatively movable parts of the suspension that said longitudinal axis of said housing is upright and said one chamber is situated upwardly of said piston; means for communicating said chambers with one another, including an interspace bounded by said peripheral surface of said piston and said internal surface of said housing, and a passage provided in said piston stem and having a port which communicates said passage with said one chamber upwardly of said piston; means for controlling the cross-sectional area of said communicating means to thereby determine the rate of flow of the gaseous medium therethrough between said chambers and thus to control the extent and speed of reciprocation of said piston axially of said housing, including a sealing ring mounted on said piston intermediate said interspace and said one chamber and having a deflectable portion which sealingly contacts said internal surface and said housing when the pressure in said one chamber exceeds that in the other chamber and which is deflected out of contact with said internal surfaces of said housing when the pressure in said other chamber exceeds that in said one chamber, and a body of liquid lubricant which constitutes a liquid seal in said one chamber on said sealing ring and has an upper level, said sealing ring and said liquid seal permitting flow of the gaseous medium through said interspace in direction from said other into said one chamber but preventing such flow in the opposite direction; and means for separting said liquid seal from said port and thus from said passage to thereby prevent said liquid lubricant from escaping from said one into said other chamber through said passage, including a cup-shaped member connected to said piston for reciprocation therewith and extending upwardly therefrom beyond said upper level of said liquid seal and surrounding a compartment in said one chamber which is filled with the gaseous medium and with which said port communicates, whereby said liquid seal is confined between said cup-shaped and said internal surface of said housing.

4,030,716

PNEUMATIC SUSPENSION ELEMENT

Herbert Freitag, Koblenz-Metternich, Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Germany

Filed July 2, 1975, Ser. No. 592,787

Claims priority, application Germany, July 5, 1974, 7422901[U]

Int. Cl.² F16F 5/00

U.S. Cl. 267—64 R **5 Claims**

1. A pneumatic suspension element comprising:

a. a cylinder having an axial wall radially bounding a cavity in said cylinder and a first radial wall sealing said cavity in one axial direction;

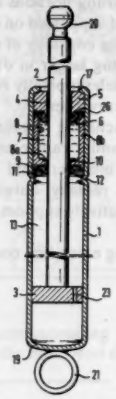
b. an annular, second, radial wall bounding said cavity in the other axial direction;

c. an annular partition fixedly mounted in said cavity and axially separating a first portion of said cavity adjacent said first radial wall from a second portion of said cavity adjacent said second radial wall;

d. a piston axially movable in said first portion and axially dividing the same into two compartments;

e. a piston rod fastened to said piston and axially extending from said first portion through said partition, said second portion, and said second radial wall outward of said cavity,

1. said partition being formed with capillary passages extending therethrough between said portions and constituting first sealing means radially interposed between said piston rod and said axial wall axially adjacent said partition for preventing flow of fluid between said portions in the absence of a difference of fluid pressure between said portions, while permitting fluid flow from one of said portions to the other portion



when the fluid pressure in said one portion is higher than in said other portion; and

f. second sealing means radially interposed between said piston rod and axial wall axially adjacent said second radial wall for preventing outward flow of fluid from said second portion of said cavity.

4,030,717

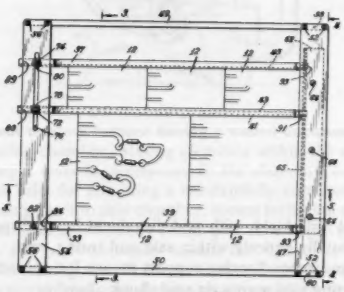
ADJUSTABLE PRINTED CIRCUIT BOARD PALLET

Frank V. Serlovsky, Westchester, Ill., assignor to D.N.S. Precision Machining, Cicero, Ill.

Filed Apr. 26, 1976, Ser. No. 680,242

Int. Cl.² B25B 5/02, 5/14

U.S. Cl. 269—118 **6 Claims**



1. A pallet for holding printed circuit boards on conveying means in a solder wave machine, said machine flowing molten solder in a wave to solder connections on the underside of the board, said pallet comprising:

a frame;

a pair of longitudinally-extending first and second bars mounted on said frame;

attaching means for mounting said frame to said conveying means;

means defining a pair of oppositely disposed longitudinally-extending grooves in said bars for receiving the opposite side marginal edges of printed circuit boards;

a transversely disposed plow bar mounted on the front portion of said frame; and

means defining a lengthwise extending groove in said transversely disposed plow bar in a common plane with said longitudinally-extending grooves for receiving end marginal edges of printed circuit boards, the lower edge of said plow bar extending below said plane so that the undersides of printed circuit boards cut into and spread out the wave of molten solder for distributing it over the underside of printed circuit boards mounted on said pallet.

4,030,718

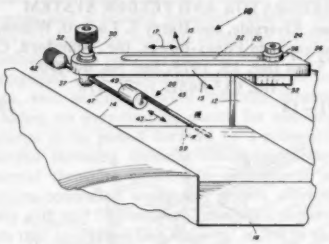
UNIVERSALLY ADJUSTABLE VISE STOP

Alexandros Philipoff, 135 Castilian Apts., Winter Park, Fla. 32789

Continuation-in-part of Ser. No. 452,954, March 20, 1974, abandoned. This application Oct. 8, 1975, Ser. No. 620,559

Int. Cl.² B23Q *3/18*

U.S. Cl. 269—315 **7 Claims**



1. A work stop for use with work holding means of the type having a pair of opposing jaws defining a corridor therebetween, said jaws being movable one with respect to the other to hold a work piece in said corridor said work stop comprising:

a bar fixed at one end thereof to the periphery of one of said jaws;

means for changing the dimension of said bar into said corridor;

means for rotating said bar with respect to said one jaw;

a stop arm pivotably mounted on the other end of said bar and spaced from said one jaw, said stop arm adapted to extend through said corridor and bear against said work piece held between said jaws;

means operable independent of movement of said bar for changing the length of said arm in said corridor;

said bar including a first hole in said another end;

a holding screw extending through said first hole and having a second hole transverse to said first hole;

a collar surrounding a portion of said holding screw out of said first hole, said collar having a third hole axially aligned with said second hole;

a nut engaging said holding screw on a side of said bar opposite said collar; and wherein

said arm extends through said second and third holes and is locked therein by rotation of said nut.

4,030,719

CHILD IMMOBILIZING DEVICE FOR X-RAYS

William Joseph Gabriele, and Joseph Michael Gabriele, both of Fenton, Mich., assignors to Contour Fabricators, Inc., Fenton, Mich.

Filed Aug. 30, 1976, Ser. No. 718,943

Int. Cl.² A61F *5/37*

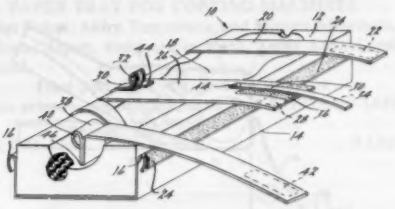
U.S. Cl. 269—328 **11 Claims**

1. An immobilizing device for use in medical procedures which comprises:

a cellular foam insert contoured with a cavity adapted to partially envelop and restrain a patient;

a plurality of restraining strap means to provide an immobilizing force on the patient;

a rigid base designed to support said cellular foam insert wherein said rigid base is comprised of a horizontal portion and two substantially vertical, longitudinal walls connected to said horizontal portion; and



a fastening means used to secure said plurality of restraining straps to said rigid base.

4,030,720

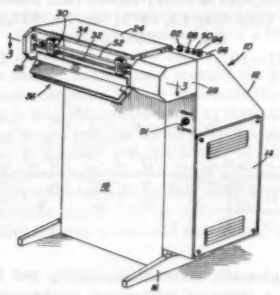
PAPER STACKER

Gary E. Jones, 103 Phillips Road, East Greenwich, R.I. 02818

Filed Feb. 17, 1976, Ser. No. 658,377

Int. Cl.² B65H *45/00*

U.S. Cl. 270—61 F **10 Claims**



1. In combination with a sheet folding and stacking apparatus having a web feeding device for withdrawing a continuous web from a buffer zone and a web folding device for depositing the web onto a folded stack, a synchronizing control system for regulating operation of a pair of drive motors drivingly connected to the web feeding and folding devices, respectively, comprising means for generating a common train of electrical pulses at a fixed pulse rate, digital divider means connected to the generating means for producing two trains of driving pulses of different pulse rates, and drive means for respectively supplying the driving pulses at the different pulse rates to the drive motors to effect operation of the web feeding and folding devices in synchronized relation to each other.

4,030,721

AUTOMATIC MANUSCRIPT DISCHARGING DEVICE FOR COPYING MACHINES

Takefumi Kurosaki, Isehara, Japan, assignor to Rank Xerox Ltd., London, England

Filed July 27, 1976, Ser. No. 709,155

Int. Cl.² B65H *29/06*

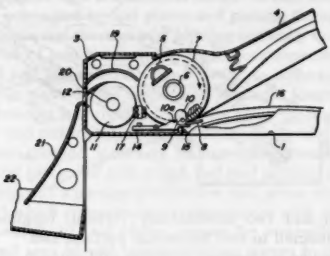
U.S. Cl. 271—3 **2 Claims**

1. An automatic document ejection device adapted for incorporation in a platen cover of a copying machine having a platen glass for placement of documents to be exposed by the copying machine comprising:

a pivotal cover overlying the platen glass;

a rotatable, document discharging roller having a gripper for gripping the lead edge of a document placed on the platen glass

a drive mechanism for rotating said discharging roller through a predetermined angle



means for closing said gripper as said pivotal cover is closed; and for opening said gripper when said discharging roller is rotated through the predetermined angle said drive mechanism being activated as said pivotal cover is lifted to discharge the gripped document.

4,030,722

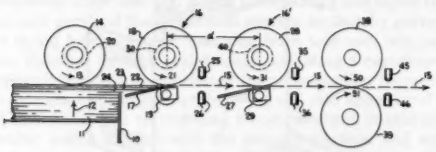
SHEET-MATERIAL SEPARATOR AND FEEDER SYSTEM

Robert Irvine, Riverside, and Harry E. Luperti, Wilton, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed May 13, 1975, Ser. No. 577,002

Int. Cl.² B65H *3/46, 7/18*

U.S. Cl. 271—10 **20 Claims**



1. An automatic material separating and feeding system separating a range of inter-mixed thicknesses of sheet-like material and feeding the separated sheet-like material in seriatim to a material-handling device, said material separating feeder system comprising:

means defining a material handling feed path;

stacking means disposed at the beginning of said feed path for stacking a quantity of inter-mixed thicknesses of sheet-like material;

a feeding means disposed adjacent said stacking means for feeding a portion of said quantity of material towards a first separating means;

a first separating means disposed along said feed path downstream from said stacking means for separating and feeding the material towards a second separating means, said first separating means comprising a first forward material thrusting element and a first adjacent material retarding element for separating multiple sheet-like materials disposed therebetween, a first independent clutching means for engaging and disengaging said first forward material thrusting element, said first forward material thrusting element including an overrunning clutch for allowing sheet-like material to be pulled forward by a subsequent forward material thrusting element when said first forward material thrusting element is disengaged; and

a second separating means disposed along said path downstream from said first means a distance less than a minimum length for said sheet-like material in said range of sheet-like materials, so that at one time during the separation of said sheet-like material, said sheet-like material will be in a bite of both separating means, said second separating means for separating and feeding the material towards a material-handling device, said second separating means comprising a second forward material thrusting element and a second adjacent material retarding element for separating multiple sheet-like materials disposed therebetween, a second clutching means for engaging and disengaging said second forward material thrusting element, said second forward material thrusting element including an over-running clutch for allowing sheet-like material to be pulled forward by a subsequent forward material thrusting element when said second forward material thrusting element is disengaged, said second separating means working cooperatively with said first separating means, such that said sheet-like material is fed to said material-handling device one sheet at a time in seriatim.

4,030,723

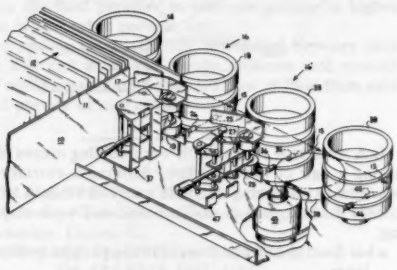
VACUUM-CONTROLLED, SHEET-MATERIAL SEPARATOR AND FEEDER SYSTEM

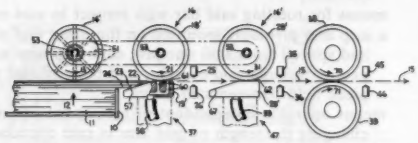
Robert Irvine, Riverside, and Harry E. Luperti, Wilton, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 15, 1975, Ser. No. 640,900

Int. Cl.² B65H *3/10, 7/18*

U.S. Cl. 271—11 **29 Claims**





1. An automatic, vacuum-controlled, material separating and feeding system separating a range of inter-mixed thicknesses of sheet-like material and feeding the separated sheet-like material in seriatim to a material-handling device, said material separating feeder system comprising:

means defining a material handling feed path;

stacking means disposed at the beginning of said feed path for stacking a quantity of inter-mixed thicknesses of sheet-like material;

a vacuum-controlled feeding means disposed adjacent said stacking means for feeding a portion of said quantity of material towards a first separating means;

a first vacuum-controlled separating means disposed along said feed path downstream from said stacking means for generally separating thicker sheet-like material of said range of intermixed thicknesses, and feeding the separated material towards a second vacuum-controlled separating means, said first separating means comprising a first forward material thrusting element and a first adjacent material retarding element for separating multiple

sheet-like materials disposed therebetween, a first independent clutching means for engaging and disengaging said first forward material thrusting element, said first forward material thrusting element including an over-running clutch for allowing sheet-like material to be pulled forward by a subsequent forward material thrusting element when said first forward material thrusting element is disengaged; and

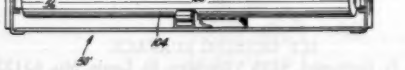
a second vacuum-controlled separating means disposed along said feed path downstream from said first vacuum-controlled separating means for generally separating thinner sheet-like material of said range of inter-mixed thicknesses, and feeding the separated material towards a material-handling device, said second separating means disposed along said feed path downstream from said first separating means a distance less than a minimum length for said sheet-like material in said range of sheet-like materials, so that at one time during the separation of said sheet-like material, said sheet-like material will be in the bite of both separating means, said second separating means comprising a second forward material thrusting element and a second adjacent material retarding element for separating multiple sheet-like materials disposed therebetween, a second clutching means for engaging and disengaging said second forward material thrusting element, said second forward material thrusting element including an over-running clutch for allowing sheet-like material to be pulled forward by a subsequent forward material thrusting element when said second forward material thrusting element is disengaged, said second vacuum-controlled separating means working cooperatively with said first vacuum-controlled separating means, such that said sheet-like material is fed to said material-handling device one sheet at a time in seriatim.

4,030,724

HIGH OPERATOR EFFICIENCY DUPLICATING SYSTEM

Eber Lyle Goodwin, Arlington Heights, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 14, 1975, Ser. No. 600,992
Int. Cl.² B65H *31/24, 29/60, 31/40*
U.S. Cl. 271—64 **7 Claims**



1. A duplication system comprising:

duplicating means for preparing copies on copy sheets and forwarding the copies in a series along a linear path to a discharge location;

a direction changing device located adjacent the discharge end of said duplicating means for accepting sheets therefrom and redirecting their motion in a direction substantially normal to the copy sheet path through the duplicator;

a sheet distributor having a feed-in conveyor and sheet receiving pockets arranged to receive the copy sheets approaching the same along said substantially normal direction, said direction changing device and said sheet distributor being of widths to accommodate more than twice the single sheet dimension of the sheets issuing from the duplicating means so as to accommodate two parallel independent sheet tracks; and

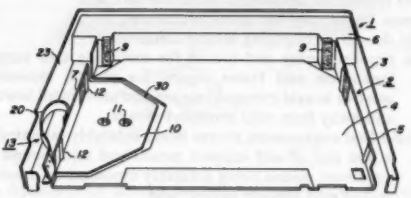
means associated with the direction changing device for selectively forwarding sheets received from said duplicating means in said substantially normal direction along either of said tracks to distinct portions of the pockets of said sheet distributor.

4,030,725

PAPER TRAY FOR COPYING MACHINES

Kiyoshige Fukui; Akira Tamamura, and Minoru Nishimoto, all of Ebina, Japan, assignors to Rank Xerox Ltd., London, England

Filed July 27, 1976, Ser. No. 709,154
Claims priority, application Japan, Dec. 9, 1975, 50-145911
Int. Cl.² B65H *1/22*
U.S. Cl. 271—164 **9 Claims**



1. In a copier including a detachably insertably mounted paper tray, said paper tray having a movable sheet side guide therein, the improvement comprising:

camming means operatively connected to said movable sheet side guide; actuator means on the copier positioned to engage said camming means and apply a force thereto as the tray is inserted into the copier,

and wherein said actuator means reduces the pressure applied to said camming means automatically once said paper tray is inserted completely into the copier;

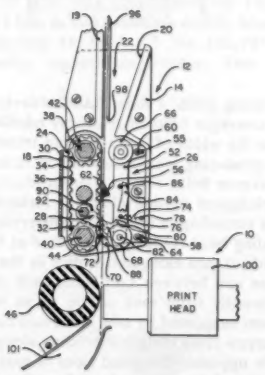
said camming means being movable by said actuator means as the tray is inserted into the copier to automatically move said movable sheet side guide of said paper tray toward paper within said paper tray and thereby automatically adjust the paper tray to conform to the size of sheets within the tray when said tray is inserted into the copier.

4,030,726

DOCUMENT FEEDING MECHANISM

Horst H. Biedermann, Augsburg, Germany, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 11, 1975, Ser. No. 639,684
Int. Cl.² B65H *9/06*
U.S. Cl. 271—246 **4 Claims**



1. A document feeding mechanism for use with a business

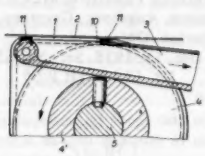
machine having a document entrance throat comprising:
frame means;
transport means and document engaging means mounted on said frame means on opposed sides of said throat;
said document engaging means having first and second spaced engagement means thereon, and an abutment means positioned in said throat to enable a document inserted in said throat to abut thereagainst;
moving means for moving said document engaging means so as to bring said first engagement means into engagement with said transport means to retain a document therebetween and thereafter move said abutment means out of said throat and simultaneously move said second engagement means into engagement with said transport means to retain said document therebetween; and
means for driving said transport means;
said document engaging means comprising:
a support means and means for mounting said support means on said frame means for pivotal movement relative to said transport means and movement towards and away from said transport means;
said first engagement means being rotatably mounted on a first end of said support means and said second engagement means being rotatably mounted on a second end of said support means; and
said abutment means being located at said second end of said support means.

4,030,727

SHEET TRANSFER DEVICE FOR PRINTING PRESSES

Willi Jeschke, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Dec. 22, 1975, Ser. No. 642,696
Claims priority, application Germany, Dec. 20, 1974, 2460504
Int. Cl.² B65H 5/22
U.S. Cl. 271—276 **8 Claims**



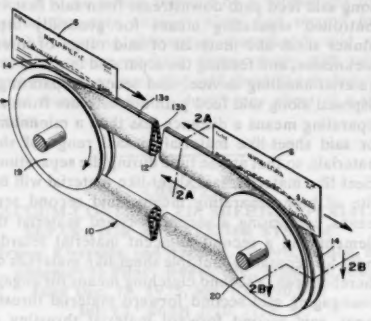
1. In a printing press, a sheet transfer device comprising a plurality of conveyor belts of relatively narrow cross section compared to the width of a sheet being transferred thereby, and suction-producing means disposed in vicinity of said plurality of conveyor belts, said suction-producing means comprising an elongated suction chamber formed with an elongated orifice extending in the sheet transferring direction and having a sealing bead respectively located at the forward and rearward ends of said elongated orifice in the sheet transferring direction and between said belts, each sealing bead extending outwardly from said orifice so as to underlie and engage a sheet supported by said belts, said conveyor belts of relatively narrow cross section extending along said elongated orifice at the opposite elongated sides of said elongated suction chamber and forming with said sealing beads a sealing extension of said elongated orifice of said suction chamber underlying the sheet being transferred.

4,030,728

DOCUMENT TRANSPORT APPARATUS

Harry L. Wallace, Garden City, and William B. Templeton, Howell, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 21, 1976, Ser. No. 678,750
Int. Cl.² B65H 5/14
U.S. Cl. 271—277 **7 Claims**



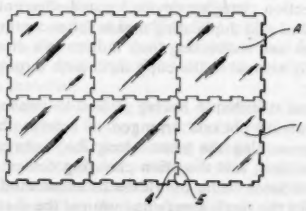
1. Apparatus for serially transporting sheet material such as documents or the like over predetermined transport path comprising:
a. an endless belt including
i. a resilient compressible tubular base member forming a loop, and
ii. gripping members each having a proximate edge and a distal edge, said proximate edges of said gripping members being attached to and projecting from respective opposite sides of said base member, and said distal edges being in close contiguity to each other outside said loop when said base member is normally uncompressed; and
b. a pair of rotatable supporting members within said loop situated at opposite ends of said transport path, at least one of said supporting members constituting a pulley having a groove in which said belt is entrained as it travels through said transport path, said groove being dimensioned to compress the portion of said base member entrained in said groove to thereby separate said distal ends of said gripping members attached to said compressed base portion.

4,030,729

ICE SKATING SURFACE

Elmer O. Nathaniel, 9178 Villaridge, St. Louis, Mo. 63123

Filed July 23, 1975, Ser. No. 598,362
Int. Cl.² A63J 3/00
U.S. Cl. 272—3 **4 Claims**



4. An artificial ice skatig surface comprising a plurality of flat planar components formed of resinous material from the class consisting of high density polyethylene, polypropylene, and fluorinated polyethylene, each of said components being

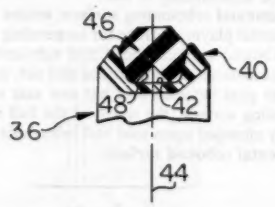
of quadrilateral configuration having first and second pairs of opposed sides, each of said sides being provided with alternating projections and recesses disposed in a plane normal to the flat planar surface of the related component, the recesses on one side being transversely aligned with the projections on the opposed side for interlockable engagement with projections on the confronting side of an adjacent component for integrating said components into the aforesaid surface, said recesses on each side of each component being rectilinear and having the bases of the recesses on each side being aligned each of said components having first and second sets of diagonally related corner portions, one set of diagonally related corners comprising meeting portions of the bases of recesses provided at the ends of the adjacent component sides, said meeting recess base portions being perpendicular to each other to form a right angular corner, the other set of diagonally related corners comprising portions of projections provided at the ends of the adjacent component sides which portions merge to form an integrated corner element each such corner element in the zone of merger having a bevel edge coplanar with the bases of said recesses and projections whereby said bevel edges are planarwise perpendicular with the flat plane of the related components, whereby the bevel edge at one corner of a component is presented in continuity with the meeting point of the right angular corner of an adjacent component so as to be presented for abutment against the like bevel edge of a third component during integration of said components to form said surface.

4,030,730

SYMMETRICAL SEAL ASSEMBLY FOR A HINGE JOINT

Roy L. Maguire, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 31, 1975, Ser. No. 627,824
Int. Cl.² F16J *15/34*
U.S. Cl. 277—92 **7 Claims**



1. A seal assembly comprising:

first and second members mounted for relative rotation about a common axis, and defining first and second axially facing end walls respectively,

a resilient seal ring defining a continuous outwardly facing annular channel so as to be of continuously uniform, generally U-shaped cross-section, the cross-section thereof being substantially symmetrical in relation to the mid-circumferential plane of said seal ring, said seal ring being positioned between the first and second axially facing end walls; and

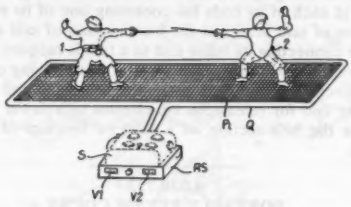
a resilient load ring disposed within said annular channel and sized to urge first and second portions of the seal ring into contact with the first and second axially facing end walls respectively.

4,030,731

ELECTRONIC EQUIPMENT FOR RADIO CONTROL OF FENCING BOUTS

Guy Delcayre, La Fleche, France, assignor to Anvar Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, France

Filed Aug. 4, 1975, Ser. No. 601,290
Claims priority, application France, Aug. 2, 1974, 74.26859
Int. Cl.² A63B *69/02*
U.S. Cl. 273—1 F **32 Claims**



1. Apparaus for scoring fencing bouts in which each fencer carries a weapon having first and second electrically conductive parts, said weapon comprising for each fencer a unit including:

means for transmitting a signal of a predetermined frequency,

means for generating pulses for application to a first electrically conductive part of the respective weapon carried by a fencer,

receiver means having an input for connection to a second electrically conductive portion of the respective weapon carried by a respective fencer,

switch means on the weapon,

means connected between said switch means and said transmitting means and responsive to a touch made by the weapon on the body of the other fencer to produce a command signal to operate the transmitting means of the unit of the fencer making a touch to produce a signal indicating the touch,

said receiver means of the unit of the fencer making the touch also including means responsive to reception of pulses from the unit of the other fencer on the weapon associated with said receiving means for blocking the command signal from affecting the transmitting means of said unit.

4,030,732

HARNESS FOR THE TEACHING OF TENNIS

Max Vincent, 12 Rue de la Republique 06500, Menton, France

Filed Oct. 15, 1975, Ser. No. 622,707
Claims priority, application France, Oct. 17, 1974, 74.39737
Int. Cl.² A63B *61/00*
U.S. Cl. 273—29 A **6 Claims**

1. A tennis practice appliance to be worn by a tennis trainee

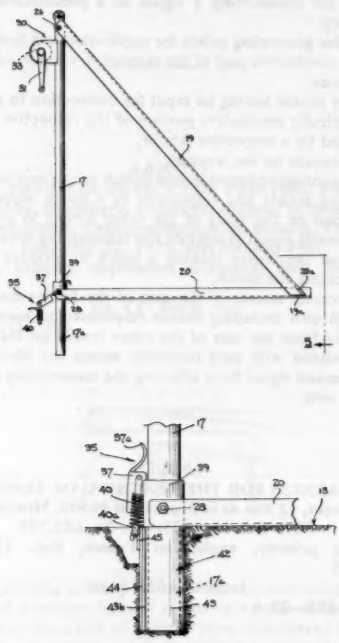
comprising: an elongated flexible band having a length to encircle the chest of a tennis trainee, said appliance and band having front and back sections when worn by the trainee; means at each end of said band cooperating to secure said band around the chest of said trainee; said band having secured thereto a pair of elongated shoulder braces, each said brace having its ends secured to said front and back sections of said band such that when said appliance is worn by said trainee, one of said braces extends over the left shoulder and the other of said braces extends over the right shoulder of said trainee; an elongated elastic link, said link having connecting means at each of its ends for conecting one of its ends to at least one of said braces at the front section of said appliance and for connecting its other end to a tennis racquet; a pair of elongated elastic tapes, each of said tapes having one of its ends attached to said back section of said band and means at its other end for releasable attachment to a lower garment, such as the belt section of a skirt or trousers of a tennis trainee.

4,030,733

PORTABLE TENNIS COURT

Larry D. Merrihew, 23721 Maidstone Place, and Phillip Zeck, 24321 Doble Ave., both of Harbor City, Calif. 90710

Filed May 28, 1976, Ser. No. 690,998
Int. Cl.² A63B 71/02
U.S. Cl. 273—29 BB **7 Claims**



1. A tennis court structure for installation on a playing surface comprising:

a playing net,

a pair of collapsible stanchion-brace assemblies for supporting said net therebetween, each of said assemblies including a stanchion, a first brace bar, one end of said bar being pivotally attached to said stanchion near one end thereof, a second brace bar, one end of said second bar being pivotally attached to said stanchion at a point therealong and spaced from said one end of said first brace bar attachment, the opposite ends of said bars being joined to each other to form a triangular configuration with said stanchion, and a latching assembly pivotally attached to said stanchion near the point of attachment of said second bar, and

an anchor pad for supporting each of said stanchion-brace assemblies, said anchor pads being installed in said playing surface and each comprising a hollow member having a pair of flanges extending therefrom, a plate member attached to said flanges, and a catch member attached to said plate member and projecting therefrom,

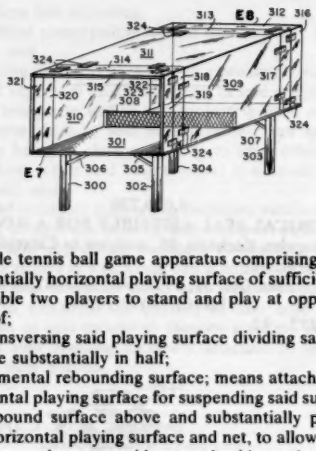
the other end of each of said stanchions being fitted in the hollow ends of an associated one of said pads with said stanchion latching assembly engaging the catch member of said plate member, the brace bars of one assembly extending towards the bars of the other assembly with said second bars running along the playing surface and braced thereagainst to support the stanchions against the inward pull of the net.

4,030,734

TABLE TENNIS GAME APPARATUS HAVING MULTI-REBOUND SURFACES

Nicholas T. Castellucci, 6901 Alcoma Drive, Penn Hills, Pa. 15235

Filed Nov. 17, 1975, Ser. No. 632,507
Int. Cl.² A63B 39/00
U.S. Cl. 273—30 **8 Claims**



1. A table tennis ball game apparatus comprising:

a substantially horizontal playing surface of sufficient length to enable two players to stand and play at opposing end thereof;

a net transversing said playing surface dividing said playing surface substantially in half;

a supplemental rebounding surface; means attached to said horizontal playing surface for suspending said supplemental rebound surface above and substantially parallel to said horizontal playing surface and net, to allow a playing ball to pass between said net and said supplemental rebounding surface, the speed of the ball not being appreciably changed upon said ball rebounding from said supplemental rebound surface.

4,030,735

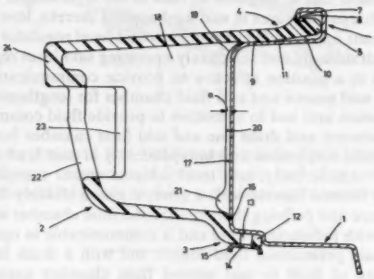
BUMPER ARRANGEMENT AND CONNECTION

Friedrich Jacob, Steimke; Gerhard Voigt, Wolfsburg, and Freidhelm Frank, Fallersleben, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Dec. 2, 1975, Ser. No. 636,987
Claims priority, application Germany, Dec. 6, 1974, 2457676
Int. Cl.² B60R 19/08
U.S. Cl. 293—71 R **4 Claims**

1. A bumper for an object to be protected, e.g., an automobile, with a closed profile-section support means comprised of a rigid rear support means and a front hollow section made of some deformable material, said hollow section partly embracing the rigid support means with two freely extending parallel shank regions of said hollow section and being connected in at

least one of these regions with the rigid support means by screw bolts, said hollow section also containing reinforcing ribs with front edges arranged at a distance from, and opposite, a front portion of the rigid support means so as to form a small gap, characterized in that only a first one of the free shank regions of the hollow section is connected with the rigid support means by screw bolts, the hollow section at the beginning of the first free shank region is provided with a support edge that bears on the front portion of the rigid support means, and a second one of the free shank regions of the



hollow section is hooked into a holding element of the rigid support means, said holding element having an approximately U-shaped cross section with an inwardly directed hook at its outer end, which hook is positioned so as to grip a recess in the end of the second free shank region towards the rear on the side facing away from the first shank region, a clearance adapted to permit the establishment of the hooked connection is provided between the other side of the end of the second free shank region and the holding element, and a surface of the second free shank region preceding the holding element bears against the rigid support means.

4,030,736

MAGNETIC TARGET THROWING GAME

Victor Petrusek, 18511 Gottschalk Ave., Homewood, Ill. 60430

Filed Jan. 2, 1976, Ser. No. 646,161
Int. Cl.² A63B 71/04; A63H 33/26
U.S. Cl. 273—95 R **2 Claims**

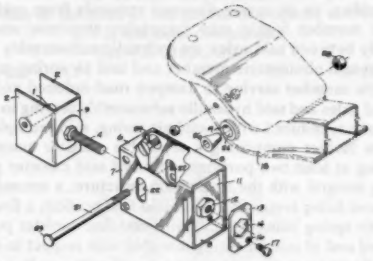
1. A game comprising a rectangular package having a frame, and a backing of magnetic susceptible material, an incomplete outline of an object on said backing within the frame, said package adapted to be suspended from a vertical surface, a plurality of magnetic tabs each simulating on one surface thereof a different feature of said object to complement the incomplete outline of said object, and tufts of hair extending from the margins of said surface outwardly to simulate the particular element of a tab, and acting as a stabilizer for the tab while being thrown at the target.

4,030,737

ADJUSTABLE MOUNTING FOR PIVOTAL WHEEL SUPPORT

Alvin C. Bridges, 1099 California Ave., Burlingame, Calif. 94010

Filed Aug. 1, 1975, Ser. No. 601,077
Int. Cl.² B62D 17/00
U.S. Cl. 280—661 **7 Claims**



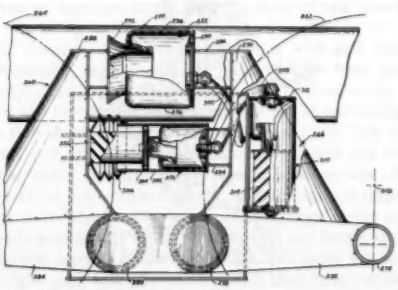
1. In an adjustable wheel pivot mounting,
a bracket frame having parallel spaced guidewalls,
means to mount the bracket frame on a frame member of a vehicle,
a hollow pivot support frame having opposite walls slidable and non-rotatable in said bracket frame between said guidewalls.
a wheel pivot shaft extended across the pivot support frame and held on the walls thereof transversely to said guidewalls,
and coacting adjusting means connected to said frames and being manipulatable for moving said pivot support frame between said guidewalls in a direction at right angles to the pivot shaft relatively to said bracket frame, thereby to adjust the location of said pivot shaft.

4,030,738

TANDEM AXLE VEHICLE SUSPENSION SYSTEM

Elwood H. Willetts, 102 S. Penataquit Ave., Bay Shore, N.Y. 11706

Filed July 19, 1976, Ser. No. 706,730
Int. Cl.² B60G 5/04
U.S. Cl. 280—681 **2 Claims**



1. A multiple axle vehicle suspension structure, comprising, in combination: transversely extending axles spaced from one another longitudinally with respect to the longitudinally axis of said vehicle suspension structure, frame members spaced transversely with respect to one another and extending between said axles, opposing rocker beam assemblies separately trunnioned in said structure at an elevation beneath the elevation of said frame members, said opposing rocker beam as-

semblies being pivotally supported at longitudinally extending ends thereof by said axles, multiple spring means reactive with respect to said axles for operationally equalizing the load as between said axles, said multiple spring means comprising a primary spring subassembly disposed intermediate and cooperative with upstanding and opposing faces on each of said opposing rocker beam assemblies, and a second subassembly responsive to said primary spring subassembly, said multiple spring means comprising an elastomeric member disposed between upstanding and opposing faces of said rocker beam assemblies, an air spring disposed remotely from said elastomeric member within said suspension structure and transversely between said axles, an hydraulic subassembly responsive to said elastomeric member and said air spring, said elastomeric member serving to dampen road-induced excitations of said axles and said hydraulic subassembly serving to damper excitations induced within said air spring, said multiple spring means further comprising a seperable canister assembly including at least two portions, a first of said canister portions being integral with the suspension structure, a second of said portions being removable from said first portion, a first end of said air spring being integral with said first canister portion, a second end of said air spring movable with respect to said first end of said air spring and being integral with one face of a bolt plate, an opposite face of the bolt plate being integral with a movable end of said hydraulic subassembly, an axially opposite end of said hydraulic subassembly being integral with a spacer member integral with said second removable canister portion, a sleeve member integral with said bolt plate and extending substantially coaxially about said hydraulic subassembly, a first relatively low-friction liner disposed internally between said sleeve member and said spacer member, a second relatively low friction liner disposed externally of said sleeve member and between the sleeve member and said removable canister, whereby substantially axial alignment between said air spring and said hydraulic subassembly is preserved during their operational working stokes.

4,030,739

SUSPENSION SYSTEM

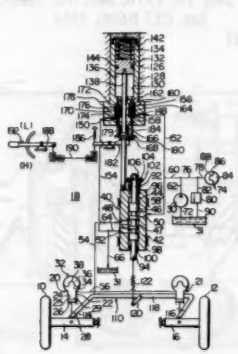
Mituo Hiruma, Kodaira, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Sept. 9, 1975, Ser. No. 611,641

Claims priority, application Japan, Sept. 10, 1974, 49-103419

Int. Cl.² B60G *11/28*

U.S. Cl. 280—708 **7 Claims**



1. A suspension system for a vehicle comprising, a retractable and extensible suspension unit having a cylinder which has defined therein a fluid chamber of variable volume filled with pressurized fluid and is communicable in operation with a pressurized fluid source and alternatively with a drain line, level regulator means for maintaining the level of a vehicle body substantially constant independently of a load applied thereto and located externally of said suspension unit, said level regulator means having means operable to a position for normally obstructing fluid communication between said source and said fluid chamber and to a position for providing fluid communication therebetween to allow supply of pressurized fluid into said fluid chamber for lengthening said suspension unit in response to falls of the level of said vehicle body due to increases in a load applied thereto and operable to a position for normally obstructing fluid communication between said drain line and said fluid chamber and to a position for providing fluid communication therebetween to allow discharge of fluid from said fluid chamber for shortening said suspension unit in response to rises of the level of said vehicle body due to decreases in said load applied thereto, level selector means operatively connected to said level regulator means for hydraulically and selectively operating said level regulator means to a position effective to provide communication between said source and said fluid chamber for lengthening said suspension unit and to a position to provide fluid communication between said drain line and said fluid chamber for shortening said suspension unit independently of said load applied to the vehicle body, said level selector means comprising a casing formed therein with a bore, a piston slidably fitted in said bore and defining therein a second fluid chamber which is filled with pressurized fluid and is communicable in operation with said pressurized fluid source and with a drain line, the pressure of fluid in said second fluid chamber urging said piston in one direction, a piston rod extending from said piston outwardly of said casing through said second fluid chamber and operatively connected to said level regulator means, biasing means for urging said piston in another direction opposite to said one direction, valve means operable for alternatively obstructing and providing communication between said source and said second fluid chamber and for alternatively obstructing and providing communication between said drain line and said second fluid chamber, and operating means for selectively operating said valve means for providing communication between said source and said second fluid chamber to allow supply of pressurized fluid thereinto and to provide communication between said drain line and second fluid chamber to allow discharge of fluid therefrom, said piston being moved in said one direction by the pressure of fluid in said second fluid chamber against the action of said biasing means to operate said level regulator means through said piston rod to provide communication between said drain line and said fluid chamber of said suspension unit for shortening thereof when pressurized fluid is supplied into said second fluid chamber, said piston being moved in said another direction by the action of said biasing means against the pressure of fluid in said second fluid chamber to operate said level regulator means through said piston rod to provide communication between said source and said fluid chamber of said suspension unit for lengthening thereof when fluid is discharged from said second fluid chamber.

4,030,740

EXPANSION JOINT

Edward L. Kniss, Jr.; Dennis L. Hixenbaugh, both of Louisville, Ky.; Jerry A. Maudlin, Perkin, and Nicholas J. Brozenick, Clarksville, both of Ind., assignors to American Air Filter Company, Inc., Louisville, Ky.

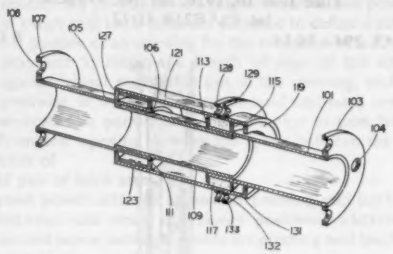
Filed July 1, 1975, Ser. No. 592,122

Int. Cl.² F16L *55/00*

U.S. Cl. 285—16 **8 Claims**

1. An expansion joint for two ducts compising: first and second opposed conduits mounted onto an inner sleeve, said first conduit being slidably mounted onto said inner sleeve and said second conduit including means affixing said second conduit to said inner sleeve; and, said opposed conduits having outwardly extending receiving means on facing ends with an outer sleeve extending around said ends thereof, the outwardly extending means of the first conduit includes a flexible packing material therein sealingly engaging said first conduit and said outer sleeve, said first conduit being in sliding rela-

tion with said outer sleeve, said second conduit including means affixed against movement relative to said outer sleeve, said outer sleeve being in two sections, a first section and a



second section, said first and second sections having opposed facing flanges thereon, said facing flanges including connecting means whereby said packing material may be removed and replaced.

4,030,741

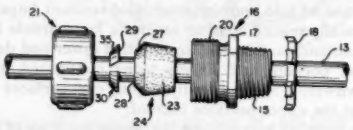
CORD GRIPS

Alfred Walter Fidrych, Stonington, Conn., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Jan. 20, 1975, Ser. No. 542,394

Int. Cl.² F16L *5/00*

U.S. Cl. 285—161 **14 Claims**



1. Apparatus fo restraining a cord member comprising, a substantially cylindrical body having a threaded section and an inner wall which defines a bore section having a longitudinal axis substantially concentric with the longitudinal axis of said cylindrical body, said cord being mountable in said bore section, a sealing element in said bore section in contact with said inner wall and the cord to provide a seal between the body and the cord, means for restraining the cord against longitudinal displacement in the bore comprising an open-sided ring formed of at least two segments which define therebetween an opening for receiving the cord, hinge means joining said segments together at one end thereof for relative pivotal movement in a plane substantially normal to the longitudinal axis of the bore whereby said ring can open and close on said cord in a plane substantially normal to the longitudinal axis of the bore, one edge of said hinge means being defined by a slot having an open end in communication with said central opening and a closed end extending outwardly from said central opening to a point inside the adjacent perimeter of said ring to leave a narrow, relatively flexible hinge member, opposed portions of the edge of said hinge means adjacent the open end of the slot being sufficiently close to provide two stop abutments which abut when the open ring sides abut to limit the contraction of said ring, camming surfaces formed on the periphery of said two segments, and rotatable means having a threaded section engaging the threaded section of said body and a camming surface for engaging said camming surfaces of said two segments, whereby upon rotation of said rotatable means in one direction, said ring is pressed between said camming surfaces and said sealing element and slides with relatively low friction therebetween such that said segments close to grip the cord.

4,030,742

FITTING FOR CONDUIT AND ELECTRICAL CABLE

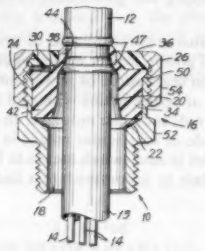
Jonah Eidelberg, Huntington Station, and Thomas Mooney, Mount Sinai, both of N.Y., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Continuation of Ser. No. 366,657, June 4, 1973, Pat. No. 3,913,956, which is a continuation of Ser. No. 194,969, Nov. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 89,303, Nov. 11, 1970, abandoned. This application Oct. 10, 1975, Ser. No. 621,368

The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.

Int. Cl.² H02G *3/00*

U.S. Cl. 285—343 **6 Claims**

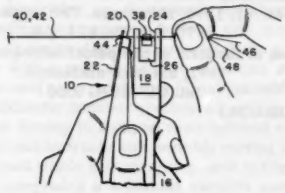


1. A fluid-tight strain relief fitting for connection with an end of a cable having a resilient outer sheath surrounding a plurality of conductors movable therein, comprising a generally tubular body having an internal bore extending into said body and passing therethrough, a bushing telescopically received within said bore and having a through bore for receiving said cable and including a base portion nesting within said body and a sleeve of reduced wall thickness extending beyond said body and terminating at its free end in an inwardly directed peripheral lip, said base portion having a substantially cylindrical portion and an outwardly extending flange at one end thereof adjacent said sleeve and axially spaced from the free end of said base portion, said flange matingly abutting a lip on said body circumferentially about their outer and inner surfaces respectively, a ring coaxially abutting said sleeve free end and at least one of the abutting faces of said sleeve and said ring being tapered, said bushing being made of a rigid plastic material, and means cooperating with said body for longitudinally urging said ring towards said base portion, thereby, circumferentially permanently contracting said sleeve and forcing the free end of said sleeve containing said lip to flow through and beyond said ring and into tight sealing contact with and depressing said resilient sheath and causing annular radial permanent contraction of a portion of said sleeve about said resilient sheath, said contraction displacing sheath material on both sides of said contracted sleeve portion to firmly anchor said fitting to said cable and firmly lock said conductors against movement within said cable and form a fluid tight seal with the cable sheath and body, at least a portion of said sleeve being sandwiched and embraced between said cable and said ring and a portion of the outer face of said sleeve coinciding with the inside face of said ring, when said ring is in its advanced position towards said bushing base portion, the radial dimensions of the sleeve and the base portion being selected so that the sleeve will deform inwardly about the base portion whereby said ring will engage the one end of the base portion and force said flange into sealing engagement with said lip.

4,030,743
SYNTHETIC YARN DEVICE

William P. Warthen, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 24, 1976, Ser. No. 689,162
Int. Cl.² D03J 3/00; B26F 3/08; B32B 31/18
U.S. Cl. 289—18 2 Claims

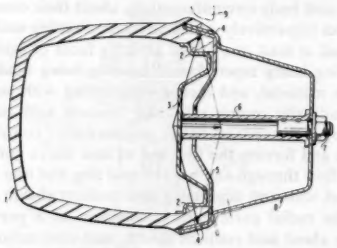


1. An apparatus to sever the tails of two tied yarns comprising: a source of power, heater means operably associated with and mounted on said source of power, switch means mounted on said source of power in line with said heater means on one side thereof, a notched plate mounted on said source of power on the other side of said heater means in line with said switch means and a slot in said switch means in line with the notch in the notched plate to accommodate a tied yarn.

4,030,744
MOTOR VEHICLE BUMPER

Norbert Schwuchow, Sindelfingen, and Hubert Hutai, Grafenau, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 3, 1975, Ser. No. 628,244
Claims priority, application Germany, Nov. 6, 1974, 2452593
Int. Cl.² B60R 19/00
U.S. Cl. 293—71 R 9 Claims



1. A motor vehicle bumper of elastic material, which includes edge areas adapted to be brought into abutment by a plate means against inclined outwardly directed walls of a mounting support means, wherein the plate means has a spacing from the mounting support means substantially on all sides and the bumper has an approximately U-shaped profile, and wherein spacer sleeve means are secured at the plate means, which are provided at the free end with a threaded insert means, said threaded insert means enabling a fastening of the plate means at a vehicle cross bearer, wherein the plate means project approximately roof-shaped from the spacer sleeve means between the edge areas of the bumper.

4,030,745
TOOL RETRIEVER FOR WELLS

William N. Schoeffler, and Romona B. Schoeffler, both of Rte. 1, Box 389, Carencro, La.

Filed June 16, 1976, Ser. No. 696,854
Int. Cl.² E21B 31/12
U.S. Cl. 294—86.14 8 Claims

1. A retriever for loose articles in wells, comprising:
a generally tubular body member adapted to be lowered into a well;
a plurality of circumferentially spaced downwardly extending resilient fingers fixed at their upper ends to a lower portion of said body member, said resilient fingers being normally spaced apart to receive a loose article therebetween and each having an inturned lower end defining a hook portion, said fingers being configured to define downwardly and outwardly sloping cam surfaces along at least the upper portions thereof;
a ring member surrounding the upper portions of said fingers and being movable downwardly along said cam surfaces to thereby flex said fingers inwardly to move said hook portions toward each other and thereby grasp a loose article in said well;
actuator means for moving said ring member downwardly relative to said tubular body member; and
interengageable latching means on said ring and on said fingers adjacent the lower ends of said cam surfaces to latch said ring against upward movement relative to said fingers after said ring has been moved downwardly over said cam surfaces and thereby prevent release of a loose article held by said hook portions and comprising protuberances on said fingers, each having a downwardly facing surface engageable with an upwardly facing surface of said ring member.

4,030,746
PIPE HANDLING HEAD

Faustyn Cornell Langowski, Houston, Tex., assignor to BJ-Hughes Inc., Long Beach, Calif.

Filed Apr. 26, 1976, Ser. No. 680,301
Int. Cl.² B66C 1/10; E21B 19/00
U.S. Cl. 294—88 19 Claims

1. A head for grasping and guiding a length of pipe which comprises:
a base,
a body,
first pivot means for pivotally mounting said body on said base,
first power actuated means for pivoting said body on said first pivot means,

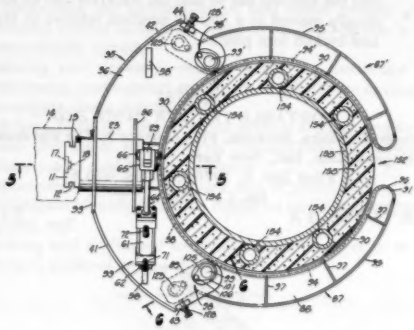
a pair of latch arms, each having a proximal end and a distal end,

other pivot means for mounting said latch arms by their proximal ends on said body in opposed relation to one another for pivotal movements between closed positions, in which said latch arms are disposed to define a substantial portion of an opening for the reception of a length of pipe and to retain the length of pipe in the opening against lateral movement out of the opening, and open positions, in which the distal ends of said latch arms are separated to permit the length of pipe to pass laterally from said opening through the space between the distal ends of

said pair of latch arms, and

second power actuated means for pivoting said latch arms between said open and closed positions, wherein said second power actuated means for pivoting said latch arms comprises:

a pair of double acting hydraulic piston-cylinder means extensible and contractible responsive to hydraulic fluid pressure, one of said pair of piston-cylinder means being



operatively associated with one of said latch arms and adapted upon extension to move said one latch arm to a closed position and upon contaction to move said one latch arm to an open position, the other of said pair of piston-cylinder means being associated with the other of said latch arms and adapted upon extension to move said other latch arm to a closed position and upon contraction to move said other latch arm to an open position,

first hydraulic fluid conduit means for simultaneously supplying hydraulic fluid pressure to said pair of piston-cylinder means to extend them,

second hydraulic fluid conduit means for simultaneously supplying hydraulic fluid pressure to said pair of piston-cylinder means to contract them, and

pilot check valve means in said first conduit means closable for maintaining hydraulic fluid pressure in said pair of piston-cylinder means to hold said pair of piston-cylinder means extended, including means responsive to hydraulic fluid pressure in said second conduit means for opening said pilot check valve means for relieving said hydraulic fluid pressure in said pair of piston-cylinder means so that said pair of piston-cylinder means can be contracted.

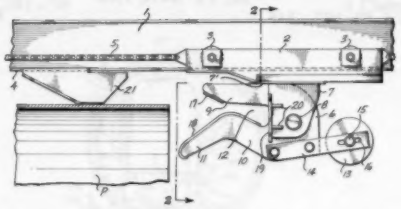
4,030,747

SHEET STRUCTURE HOISTING GRIPPER

Charles Richard Morse, Anchorage, Alaska, and Alan Leslie Ross, Seattle, Wash., assignors to Charles Richard Morse, Anchorage, Alaska

Filed Feb. 20, 1976, Ser. No. 659,938
Int. Cl.² B66C 1/22
U.S. Cl. 294—92 **17 Claims**

7. In sheet structure handling mechanism including lifting means and gripping means carried by the lifting means for lifting engagement with a sheet structure, the gripping means including a bifurcate gripper forming a throat engageable with the sheet structure and pivot means supporting such gripper for free tilting relative to the lifting means effected by downward force exerted on such gripper by the weight of the sheet structure, which tilting binds the gripper to the sheet struc-



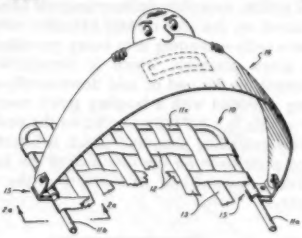
ture, the improvement comprising the gripper throat being elongated and having a closed end, the pivot means being adjacent to said closed end of the throat and substantially aligned with the length of the throat, and positioning means for normally holding the gripper in a position in which its elongated throat is substantially horizontal.

4,030,748

SUN SHADE APPARATUS

Helmut E. Brock, 551 Loughlin Road R.D. 6, Binghamton, N.Y. 13904

Filed Oct. 7, 1975, Ser. No. 620,383
Int. Cl.² A47C 7/66
U.S. Cl. 297—184 **2 Claims**

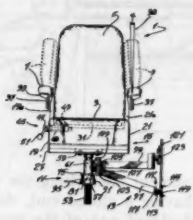


1. A sun shade assembly for attachment to a chair having a pair of generally parallel side frame members spaced apart on opposite sides of the chair, comprising, in combination: first and second clamping means for mounting at a plurality of desired positions along respective ones of said side frame portions, each of said clamping means comprising an upper and a lower plate member and means for bolting said upper and lower members together with a respective one of said side frame portions of said chair clamped therebetween, said upper plate member having an upstanding tab portion having a bolt hole; and an elongated semi-flexible plastic sheet extending between and having its ends pivotally attached to and frictionally engaged by respective ones of said clamping means, the length of said plastic sheet member exceeding the distance between said side frame portions of said chair whereby said plastic sheet member is held bowed in a generally arcuate shape, each end of said plastic sheet member being bolted to the upper member of a respective one of said clamping means by means of a bolt passing through said bolt hole and the end of said plastic sheet member, and compressible washer means carried on each said bolt between each upstanding tab portion and the end of said plastic sheet member, said plastic sheet member having a central portion of greater width than said ends of said plastic sheet member.

4,030,749
DIESEL CAB SEAT ASSEMBLY

Charles Strahm, Laval, Canada, assignor to Mount Royal Transportation Equipment Ltd., Montreal, Canada

Filed Dec. 15, 1975, Ser. No. 640,855
Int. Cl.² A47C 1/02
U.S. Cl. 297—345 8 Claims



1. A seat assembly for a locomotive cab or the like comprising:

a. a seat portion;

b. a back portion pivoted at a rear portion of said seat portion;

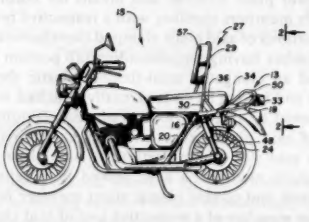
c. a height adjusting mechanism mounted on and beneath said seat portion;

d. means for wall mounting said seat assembly on the wall of a cab, said means for wall mounting said seat assembly comprising a cantilever support, said cantilever support comprising a central, downwardly-extending arm and two, horizontally-diverging arms, said arms being held at one end by an upstanding leg of an angle bracket, the other end of each of said horizontal arms being formed with a plate, said plate being engagable in a guide channel mounted on the wall of said cab, the other end of said downwardly-extending arm being provided with a leveling screw assembly which is threadable in a holder mounted on the end of said downwardly-extending arm being provided with a leveling screw assembly which is threadable in a holder mounted on the end of said downwardly-extending arm, and which is inserted in a perforated plate fixed on the side wall of the locomotive thus allowing forward and aft mobility of the whole seat assembly.

4,030,750
SISSY BAR FOR A MOTORCYCLE

Doug Abram, 7101 - 65th Ave. North, Minneapolis, Minn. 55428

Filed Feb. 28, 1975, Ser. No. 553,896
Int. Cl.² B62J 1/00, 1/28
U.S. Cl. 297—375 10 Claims



1. A sissy bar for a motorcycle having a seat comprising, in combination:

a longitudinally movable backrest extending above the seat comprising;

two sliding portions;

an upwardly extending portion having two ends at the bottom thereof pivotally attached to each of the sliding portions; and

means for tilting the backrest comprising two telescoping members pivotally attached to each end of the upwardly extending portion and each of the two sliding portions, respectively, the telescoping members fitting one within the other, and wherein the outer one of each of the telescoping members has means for locking each of the two telescoping members together to prevent relative movement therebetween whereby the upwardly extending portion can be inclined to a desired position and locked into place;

a support bar having a forward end and a rearward portion surrounding the seat upon the forward end of which the backrest is mounted and wherein the rearward portion of the support bar comprises means for limiting the rearward longitudinal movement of the backrest;

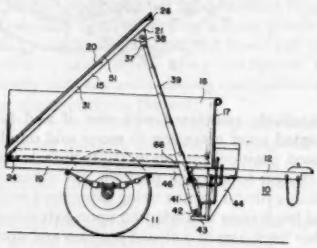
fastening means fixedly secured to the support bar for attaching the support bar to the motorcycle; and

locking means for operatively connecting the backrest and the support bar so that the backrest can be longitudinally moved to a desired position relative to the seat and locked into place.

4,030,751
PORTABLE TRAILER DUMP BED

George R. Bobka, Sarasota, Fla., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 5, 1976, Ser. No. 646,617
Int. Cl.² B60P 1/16
U.S. Cl. 298—1 A 2 Claims



1. A cargo vehicle formed with an open box structure formed of a floor plate joined to a forward and to opposed side walls, which box structure is fixed to the vehicle, together with a removable dump bed plate, the rear end of which is detachably jointed by a hinge to the rear of the floor plate of the said box structure, said dump bed plate of a size to extend between the side walls of the open box structure, with hydraulic means detachably mounted to the underside of the forward section of the dump bed plate and to the vehicle for elevation of the forward end of said plate so as to pivot said plate about said hinge, with the forward edge and the side edges of said plate fitted with gasket material that contacts the fixed front and side walls of the box structure when the dump bed plate is in the retracted position and during elevation of the dump bed plate.

4,030,752
LONGWALL MINING OF THICK UNDERGROUND MINERAL SEAMS

Terry Lee Simpson, Westminster, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 8, 1976, Ser. No. 664,436
Int. Cl.² E21C 41/04
U.S. Cl. 299—11 9 Claims

1. A method of minimg thick seam underground mineral

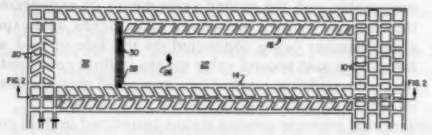
deposits underlying a competent rock layer comprising the steps of:

a. driving main entries from a portal to the boundaries of the mineral seam to be mined,

b. driving parallel submain development entries from the main entries into the top of the seam so that the rock layer forms the mine roof,

c. driving spaced apart sets of parallel panel entries at right angles to said submain development entries along a first path to the bottom of said seam,

d. continuing said parallel sets of panel entries along a second path coincident with the bottom of said seam until the boundaries of the mining area are reached,



e. connecting the extremities of said panel entries with bleeder entries to define a series of longwall panels to be sequentially mined,

f. mining said panels in retreat under the protection of advancing roof support structures to induce the caving of overlying strata therebehind,

g. driving auxiliary sets of panel entries at right angles to said first set of panel entries beneath and in the same direction as said submain entries,

h. interconnecting said auxiliary sets of panel entries with additional bleeder entries to define an additional longwall panel, and

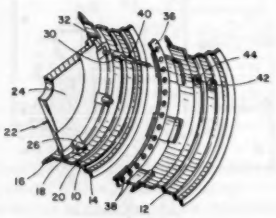
i. mining said additional longwall panel in retreat so as to induce sublevel caving therebehind.

4,030,753

DUAL WHEEL CONSTRUCTION

Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Gibson City, Ill.

Filed May 2, 1975, Ser. No. 573,983
Int. Cl.² B60B *11/00*
U.S. Cl. 301—36 R **7 Claims**



2. In a dual wheel construction of the type including first and second separate rims, one of the rims including a hub assembly for attachment to an axle, said hub assembly including a plurality of fastening means for attaching a hub plate to the one rim, the improvement comprising, in combination:

a plurality of separate, circumferentially arranged plates fixed to the other rim and projecting laterally therefrom toward the one rim, said plates being spaced about the circumference of the other rim and having unattached projecting ends;

a closed circular ring member having one edge connected with all of the plates; and

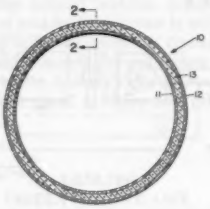
means for connecting the ring member with the fastening means and simultaneously maintain the projecting ends of the plate in contact with the one rim.

4,030,754

COMPOSITE LIGHTWEIGHT WHEEL RIM

John Barton Merlette, Sandy, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 21, 1976, Ser. No. 651,373
Int. Cl.² B60B *5/02*
U.S. Cl. 301—98 **6 Claims**



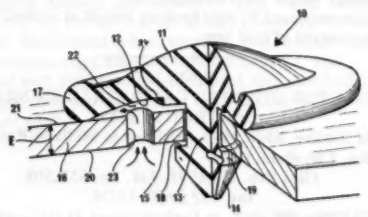
1. A rim for a spoked wheel comprising an inner ring, an outer ring spaced from said inner ring, and a hardened resin foam filling the space between said rings and bonding said rings together, said inner and outer rings each made from a plurality of plies of composite material, each ply having a plurality of parallel fibers positioned in a resin matrix.

4,030,755

METHOD AND APPARATUS FOR FLUIDIFYING POWDEROUS SUBSTANCES

Wolfram Heimke, Antibes, France, assignor to Union Industrielle et d'Entreprise, Paris, France

Filed Dec. 31, 1975, Ser. No. 645,641
Claims priority, application France, Apr. 2, 1975, 75.10247
Int. Cl.² B65G *53/16*
U.S. Cl. 302—29 **6 Claims**

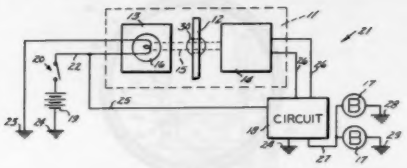


1. An apparatus for fluidifying powderous substances which are in contact with a wall such as the wall of a hopper or a conveyor, said apparatus being entirely made of a resilient material and comprising a substantially circular flattened dome the arch of which is integrally connected at its concave side to an axially extending substantially cylindrical holding stud adapted to be inserted into a circular mounting hole provided to this end in said wall, said stud having a tapered end and being provided near said tapered end with an annular blocking shoulder having a diameter larger than that of said mounting hole, the distance between the plane containing the surface of said annular blocking shoulder and the plane containing the lower annular edge of said dome prior to insertion of said apparatus into said mounting hole being substantially smaller than the thickness of said wall, the arrangement being such that when said holding stud is inserted in said mounting hole provided in said wall and said blocking shoulder engages one surface of said wall, the concave side of said dome forms with the opposite surface of said wall a substantially semi-lenticular chamber adapted to be connected to a source of pressurized fluid through an inlet hole provided in said wall at a location adjacent said mounting hole.

4,030,756
MAGNETIC DAMPENED INERTIAL SENSOR FOR BRAKE AND SWAY CONTROLS

Edward Joseph Eden, Jackson, Mich., assignor to Tekonsha Engineering Company, Tekonsha, Mich.

Filed Dec. 29, 1975, Ser. No. 644,600
Int. Cl.² B60T *8/16*
U.S. Cl. 303—24 A **5 Claims**



1. A pendulum type inertial sensing device for controlling brakes in towed vehicles by interference with light transmission comprising:

a frame;

a rigid pendulum arm;

a pivot operably connected to said frame from which said pendulum arm depends;

a magnetically attractable material at the lower end of said pendulum arm;

a magnet beneath said pivot and supported by said frame and in selected spaced-apart relation to said magnetically attractable material;

a light source;

a light monitoring target toward which said light source is directed;

a light interrupter on said arm which selectively attenuates light from said light source to said target in accord with the positioning of said arm;

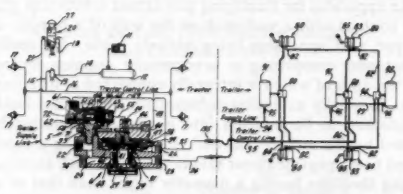
an electric braking circuit controlled by the light transmitted between said source and said target and pulsing a power output therethrough; and

brakes energized by said braking circuit in accord with the movement of said arm.

4,030,757
TRACTOR-MOUNTED CARGO-TRAILER BRAKE CONTROL SYSTEM

Harold Durling, Elsie, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Feb. 17, 1976, Ser. No. 658,508
Int. Cl.² B60T *15/36*
U.S. Cl. 303—28 **6 Claims**



1. A positive-pressure air-brake system for activating brake actuators of a tractor and a trailer connected thereto comprising:

an air pressure source mounted on a tractor;

a first control line from said source to said actuators of the tractor;

normally-closed brake-actuation valve means in said control line having mechanism for venting the downstream portion of said control line at closed position;

said trailer brake-actuators comprising spring means acting on the trailer brakes for parking and emergency brake actuation, first air-motor means for overriding said spring means to maintain the brakes in released condition, second-air motor means for applying the trailer brakes for normal stops;

a tractor protection valve having a first port connected by a direct supply line with said source, a second port connected with said first motor means, a third port connected with said second motor means, and a normally open passageway between said first port and said second port;

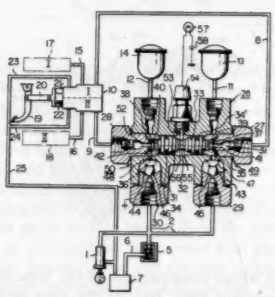
said protection valve comprising pressure-sensitive throttle means for closing said first port, second spring-loaded normally-closed valve means openable to place said passageway in fluid communication with said third port, a spring-return reciprocable wall of an expansible chamber engageable with the second valve means on expansion of the chamber to open the second valve means, said expansible chamber being connected on the side of said wall away from said second valve means in fluid communication with said first control line at a point thereon downstream from said brake actuation valve means;

differential pressure-sensing means connected in fluid communication with said first control line at a point downstream from said brake actuation valve means, and with said third port to measure the difference in fluid pressure therebetween, said differential-pressure sensing means being constructed to communicate fluid pressure from said first control line to said throttle means to close said passageway when the pressure in said first control line is greater than that at said third port, said throttle means being responsive to greater pressure communicated from said source than in said first control line to open said passageway.

4,030,758
DUAL SYSTEM HYDRAULIC BRAKING APPARATUS FOR VEHICLE

Yoshihiro Hayashida, Chigasaki, Japan, assignor to Tokico Ltd., Japan

Continuation of Ser. No. 456,660, April 1, 1974, abandoned.
This application Mar. 24, 1976, Ser. No. 669,876
Int. Cl.² B60T *15/46*
U.S. Cl. 303—84 A **3 Claims**



1. In a dual hydraulic braking system for use in a vehicle:

a pair of braking systems;

a pair of hydraulic accumulators, one for each system;

a hydraulic pump for supplying hydraulic fluid to said systems;

and valve means comprising:

a valve body having a cylinder bore;

means for closing the opposite ends of said bore;

a piston slideably mounted in said bore and cooperating with said bore to define a pair of chambers,

each chamber being located between a closed end of the bore and an adjacent end of said piston;

means for biasing said piston to a central position in said bore;

a pair of first passages, each first passage communicating between said hydraulic pump and one of said chambers;

a pair of check valves disposed in said valve body, each check valve being located in one of said first passages to prevent hydraulic fluid flow from a chamber to said hydraulic pump;

a pair of second passages, each second passage communicating between one of said chambers and one of said hydraulic accumulators;

a pair of third passages including a port located in the means for closing an end of said cylinder bore, each said port being surrounded by a valve seat, each third passage communicating between one of said chambers and one of said braking systems;

and means on the opposite ends of said piston to close the third passage adjacent an end of said piston to prevent fluid flow therethrough when said piston is moved in either direction from its central position, each of said accumulators being connected to one of said third passages downstream of said valve seats through a respective transverse passage formed integrally in said valve body, and the means on a respective end of said piston engaging one of said valve seats to effect closure of a third passage.

4,030,759

PNEUMATIC ANTI-SKID BRAKE SYSTEM HAVING PROPORTIONAL PRESSURE CONTROL MEANS

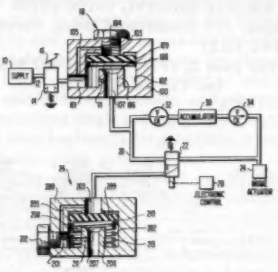
Carmelo Gemmellaro, Turin; Virginio Maggioni, Rosta (Turin), and Renzo Moretti, Cambiano (Turin), all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed May 22, 1975, Ser. No. 580,006

Claims priority, application Italy, May 30, 1974, 68689/74

Int. Cl.² B60T *8/02*

U.S. Cl. 303—119 **2 Claims**



1. In a pneumatic anti-skid braking system for at least one wheel of a vehicle, of the type comprising:

a pressure source of compressed air, brake actuator for said at least one wheel of said vehicle,

means interconnecting said pressure source and said brake actuator, said interconnecting mean including braking control valve means operated by brake operating means to apply braking pressure from said pressure source to said brake actuator,

anti-skid control means sensitive to the dynamic state of said at least one vehicle wheel and operating to produce an output control signal when said at least one vehicle wheel is in an incipient skidding state,

first valve means in said interconnecting means and connected to said anti-skid control means, said first valve means operating to cause a controlled release of braking pressure when a control signal is received from the output of said anti-skid control means,

second valve means in said interconnecting means, said second valve means operating to control the rise in braking pressure after the output signal from said anti-skid control means is removed,

the improvement wherein there are provided: accumulator means in parallel with said first valve means two unidirectional valves one on each side of said accumulator means, said unidirectional valves being oriented such that said accumulator charges up to the braking pressure in said actuator during normal braking, retains said pressure upon release of said brake actuator in anti-skid operation of said first valve means under the control of said output signal from said anti-skid control means, and discharges said pressure to the braking circuit upon removal of the anti-skid control signal to share said pressure with said brake actuator.

4,030,760

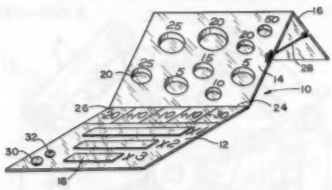
TIDDLYWINKS GAME

Edwin K. Danowski, Racine, Wis., assignor to General Converters & Assemblers, Inc., Racine, Wis.

Filed Dec. 23, 1975, Ser. No. 643,752

Int. Cl.² A63B *71/04*

U.S. Cl. 273—95 E **14 Claims**



1. In a tiddlywinks game of the type having shooter chips, shot disks, a launch area, and a target receptacle, the improvement comprising:

a major target surface, said surface both having sufficiently slippery surface characteristics and being sufficiently slanted to the horizontal whereby said shot disks may slide thereacross when thereon, said surface having a lowermost edge adjacent said launch area; and

at least one target receptacle under and attached to said target area and having an open mouth flush with said major surface.

4,030,761

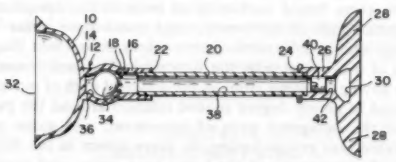
DART

Hans Daller, c/o H. Daller Realty Ltd., 3256 Eglinton Ave. East, Scarborough, Ont., Canada M1J 2H6

Filed Sept. 8, 1976, Ser. No. 721,336

Int. Cl.² A63B *65/02*

U.S. Cl. 273—106.5 A **6 Claims**



1. A dart comprising a suction cup, a protrusion fixedly secured to the convex exterior surface of said suction cup, said protrusion including a cavity and an open mouth portion, said open mouth portion disposed at the free end of said protrusion and communicating to said cavity, a spherical bulgelike excursion in the walls of said protrusion, said excursion extending radially outwardly from said cavity, a plurality of holes being

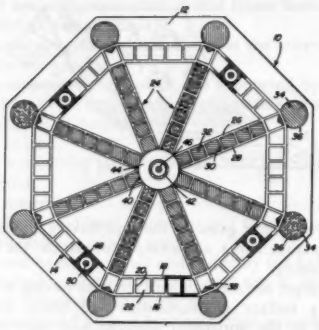
disposed in spaced apart relationship about the circumference of said excursion intermediate the widest portion thereof and said open mouth portion of said protrusion, means to selectively vent said cavity to the atmosphere when said suction cup is disposed in a lower position than said open mouth portion, a whistle sound generating apparatus, means to fluidly communicate said open mouth portion to said whistle sound generating apparatus, a plurality of stabilizing fins affixed to the proximal end of said dart.

4,030,762

BOARD GAME WITH DIAGONAL PATHS

Bennett J. Gilmore, 1114 Phillips Drive, P.O. Box 1091, Dumas, Tex. 79029

Filed Apr. 8, 1976, Ser. No. 675,204
Int. Cl.² A63F 3/00
U.S. Cl. 273—134 AD **1 Claim**



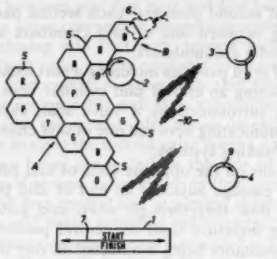
1. A game device for playing a game by a plurality of teams of players with each team including at least two players, said game device comprising a game board having a substantially planar upper surface, said game board being of octagonal configuration, an octagonal path of movement delineated on said game board in concentric, inward spaced relation to the periphery of the game board with the octagonal path of movement being divided into a plurality of segments with the apices of the octagonal path of movement being in alignment with the apices of the game board, four distinguishably colored diagonal paths of movement delineated on said game board and extending transversely between opposed apices of the octagonal path of movement, said diagonal paths being divided into a plurality of segments, a home base area delineated on the game board outwardly of each of the apices of the octagonal path of movement, said home base areas being distinguishably colored the same colors as the four diagonal paths of movement with the oppositely disposed home base areas having the same color as the diagonal path of movement oriented in ninety degree spaced relation around the periphery of the octagonal path of movement, and game pieces separated into groups having the same colors as the diagonal paths of movement and the home base areas, said groups of game pieces being assigned to the teams of players with each team's game pieces being the same color and the game pieces of each team player being distinguishable by shape from the game pieces of the other team player, said game pieces being movable from a home base area of the same color as the game pieces assigned to a team toward an opposite home base area along the octagonal path of movement or diagonal paths of movement in accordance with a chance device and selection of a mode of movement by a player.

4,030,763

DICE GAME

Peter James Calvert Quigley, 9 Milton Road, Eastbourne, Sussex, England

Filed Jan. 29, 1976, Ser. No. 653,453
Int. Cl.² A63F 9/14
U.S. Cl. 273—134 D **7 Claims**



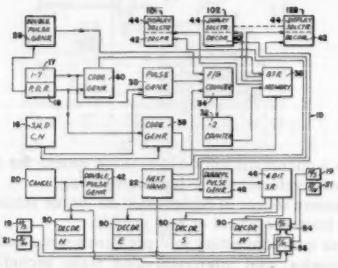
1. A game for playing on a flat playing surface by at least two players, comprising at least one playing die bearing a variety of markings for determining each player's moves by chance depending on which marking on the die is indicated after a throw, at least two sets of a plurality of playing pieces, one set for each player, each set having the same number of pieces, each playing piece of a set being polygonal in plan view when placed on the playing surface and bearing a different respective marking identical with one of the respective variety of markings on the die, and a plurality of direction indicator means for placing on the playing surface, each and for indicating a direction of travel so as to prescribe a general path to be followed by the playing pieces over the playing surface.

4,030,764

BRIDGE BIDDING INDICATOR

Albert V. Mattos, 397 Southerland Drive, Toronto, Ontario, Canada (M4G 1K2)

Filed June 2, 1976, Ser. No. 692,095
Int. Cl.³ A63B 71/06
U.S. Cl. 273—148 A **2 Claims**



1. A bridge bidding indicator comprising:

a frame formed with a plurality of recesses for holding respective packs of cards;

a display unit disposed on said frame, said display unit including a multiplicity of electrically actuable indicia representative of a suit or no-trump, the number of tricks, and pass, double and re-double, said display unit including a plurality of light-emitting diodes for displaying said indicia, said indicia being representative of a suit or no-trump, each of said indicia including a plurality of separately actuable elements, said indicia being disposed in a plurality of rows and columns intersecting with said rows, each of said rows being indicative of a round of a multi-

plicity of biddable rounds, and each of said columns being indicative of a bid submittable successively by one and the same player;

a signalling unit disposed on said frame, said signalling unit including a plurality of manipulable means indicating said plurality of inidica for selective actuation thereof on said display unit by a player, the first of said rows of said display unit including a plurality of electrically actuable designations representative of respective players, and wherein said designations are actuable and successively shiftable by said manipulable means in, and along said first row respectively; and

circuit means disposed on said frame for causing the display of said indicia on said display unit in a plurality of successive columns and rows, respectively, in dependence of successive actuation of said manipulable means by respective players, said circuit means including code generator means for digitally encoding said indicia, counting means for counting the number of said indicia encoded by said code generator means, and wherein said manipulable means include erase means for cancelling the display shown by the last actuation of one of said manipulable means, wherein said counting means include a forward-/backward counter actuable for a forward count of said indicia and for backward counting by actuation of said erase means, and wherein a subsequent actuation of said manipulable means to supersede the erased display causes the count of said number of said indicia to include only displayed indicia, the manipulable means including clearing means connected to said electrically actuable indicia for clearing and resetting all of said display indicia thereon, said manipulable means including a first keyboard having a first plurality of keys indicating one of the suits or a no-trump, respectively, a second keyboard having a second plurality of keys indicating one of the pass, double and re-double bids, respectively, and a third keyboard having a third plurality of keys indicating one of the rounds, respectively, said circuit means including addressing means for routing said encoded indicia to a selected location at an intersection of one of said rows and columns in dependence on the number of indicia counted by said counting means and decoding means, and including display selector means for decoding and displaying the decoded indicia routed to said selected location by said addressing means, and wherein said circuit means includes a single pulse generator connected to said first and third keyboards for generating a single pulse, and a first double pulse generator connected to said second keyboard for generating a first double pulse, a second double pulse generator connected to said erase means for generating a second double pulse upon depression of one of said keys, respectively, a divide-by-two counter connected to the output of said forward/backward counter, and wherein said single and said first double pulse generators are connected to the output of said forward/backward counter, for the latter to count in a forward direction, and said second double pulse genrator is connected to said forward/backward counter to count in a reverse direction.

4,030,765

STORAGE DEVICE FOR SHARED GAME PIECES

John William Brown, 1847 W. Estes Ave., Chicago, Ill. 60626

Filed Feb. 18, 1976, Ser. No. 659,106
Int. Cl.² A63F *3/00*
U.S. Cl. 273—148 R **1 Claim**

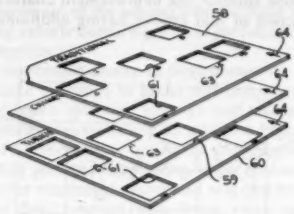
1. In combination,

means for providing a plurality of storage compartments, each of said compartments having an access means therein,

a plurality of playing pieces for a plurality of varieties of chess games, and

a plurality of templates having different aperture arrays,

each of said templates cooperating with said access means to provide access to a different plurality of compartments,



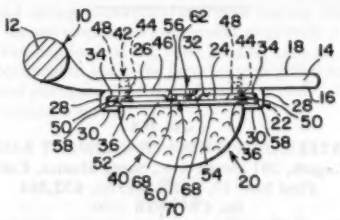
each of said different plurality of compartments containing the pieces for a different chess game.

4,030,766

GOLF CLUB WITH ALIGNING MEANS

Josiah F. Derr, 335 E. 2nd, Berwick, Pa. 18603

Filed July 8, 1976, Ser. No. 703,458
Int. Cl.² A63B *53/04, 69/36*
U.S. Cl. 273—163 R **10 Claims**



1. In a golf club having a club shaft and a head with its face in substantially vertical plane,

A. housing means having a chamber contained therein and including a base portion, a pair of side walls integrally formed with said base portion and a pair of spaced apart front walls each integrally formed with said side walls and extending in a plane substantially parallel to said base portion for defining said chamber,

B. fastener means extending through said base portion for securing said housing means to the golf club head,

C. alignment means adapted to be received within said chamber in relatively fixed position with respect thereto, said alignment means including a frame member adapted to extend between said side walls and within said chamber and a spherical section secured to said frame member extending exteriorally of said chamber and including a generally spherical surface having the same diameter of a golf ball and when viewed from above definding essentially a hemispherical mass, and

D. restraining means engageable with said alignment means and said housing means to prevent removal of said alignment means when the golf club is in use.

4,030,767

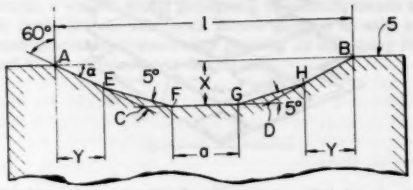
CHROME INSERT RING

Isao Taniguchi, Yono, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,488
Claims priority, application Japan, Aug. 2, 1975, 50-93697
Int. Cl.² F16J *15/00, 9/12*
U.S. Cl. 277—235 R **6 Claims**

1. A hard metal insert piston ring of the type having a groove in the periphery thereof, said groove being filled with said hard metal, the cross section of said groove having a flat

bottom wall and two flat side walls extending angularly from the surface of said piston ring towards said flat bottom surface and towards one another, the improvement characterized by; said cross section of said groove having additional flat side



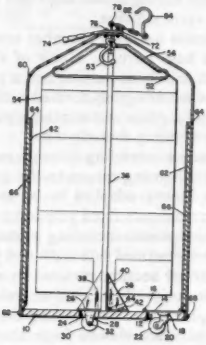
walls between said first mentioned side walls and said flat bottom surface, all said walls and said bottom surface meeting at angles greater that the angle between imaginary extensions of said first side walls and said flat bottom surface.

4,030,768

STEERABLE WHEELED GARMENT BAG

Max J. Lugash, 201 Ocean Ave., Santa Monica, Calif. 90402

Filed Nov. 17, 1975, Ser. No. 632,364
Int. Cl.² B62B *3/00*
U.S. Cl. 280—47.17 **6 Claims**



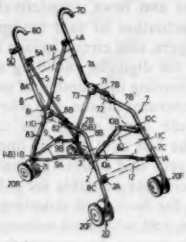
1. Wheeled hand luggage comprising:
a. a vertically elongate enclosure having top, bottom, side, front and rear walls;
b. a tanden pair of wheels mounted on said bottom wall of said enclosure;
c. rigid means connecting said top wall of said enclosure with said bottom wall of said enclosure and positioned within said enclosure;
d. means at the upper end of said rigid means for suspending garments within said enclosure;
e. one of said pair of wheels being mounted at the front portion of said bottom wall and the other of said wheels being mounted centrally on the said longitudinal axis of said bottom wall and adjacent said rigid means;
f. and said front wheel being castered about a vertical pivot and said centrally mounted wheel being non-castered.

4,030,769

STRUCTURES FOR FOLDING BABY-CARRIAGES, CHAIRS, AND THE LIKE

Luke Shih-Cheng Peng, No. 30-1 Lane, 350, Wu Hsing Street, and Herbert Chia-Chen Yu, No. 2-4, Alley 12, Lane 118, Jen Ai Road, Sec. 3, both of Taipei, China /Taiwan

Filed May 24, 1976, Ser. No. 689,598
Int. Cl.² B62B *11/00*
U.S. Cl. 280—42 **5 Claims**



1. A collapsible carriage structure comprising:
a collapsible bottom cross-frame formed by a first pair of intersecting interpivoted rigid elements;
a collapsible back cross-frame formed by a second pair of intersecting interpivoted rigid elements, said bottom and back cross-frames articulately interconnected at a pair of respective ends;
two collapsible side brace assemblies each comprising an upper, lower and middle section, said upper sections including handle means,
said upper sections articulately interconnected to the respective upper ends of the back cross-frame, and inclined backward and parallel to each other when unfolded,
said lower sections articulately interconnected to the respective front ends of the bottom cross-frame, and inclined backward and parallel to each other when unfolded,
said middle section forming a generally horizontal arm rest comprising:
a horizontally disposed lower extension of said upper section;
a horizontally disposed upper extension of said lower section; and
a knuckle member joining said extensions together to form a collapsible joint;
two rigid rear support legs each connected on one end to a respective one of said lower extensions of said upper sections by means of a triangular knuckle member and each articulately connected to the respective rear end of said bottom cross-frame;
means for releasably locking said structure in the open position; and,
pairs of double wheel sets disposed on the lower end of said lower sections of said side assemblies and on the lower end of said rear legs;
said cross-frames and side brace assemblies capable of being cooperatively collapsed so as to cause the carriage structure to occupy a diminished cross-sectional area.

4,030,770
REAR WHEEL JACKING SYSTEM

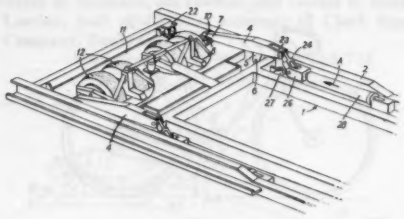
Kenneth B. Board, Stow Maries, England, assignor to Atel Products Limited, Southend-on-Sea, England

Filed Oct. 28, 1975, Ser. No. 626,487

Claims priority, application United Kingdom, Nov. 1, 1974, 47449/74

Int. Cl.² B62D *33/08*

U.S. Cl. 280—43.23 **9 Claims**



1. A cargo lifting vehicle comprising chassis means, said chassis means comprising a relatively forwardly directed end, a relatively rearwardly directed end, first side frame member means, second side frame member means, said first and second side frame member means comprising and being at generally opposite sides of said chassis means, at least first and second wheel means situated inboard of said side frame member means, rigid support means operatively interconnecting said first and second wheel means to each other and effective to maintain the axes of said first and second wheel means elevationally fixed with respect to each other, said rigid support means being situated inboard of said side frame member means as to have the ability of upward and downward movement relative to said side frame member means, linkage means operatively connected to said rigid support means and to said side frame member means for movement relative to both said rigid support means ands said side frame member means, and power applying means operatively connected to said linkage means, said power applying means being effective when energized to cause selective upward and downward movement of said rigid support means and wheel means relative to said side frame member means.

4,030,771
VEHICLE BRAKING SYSTEM

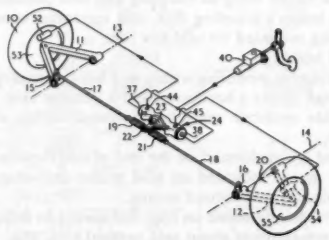
Alastair John Young, Leamington Spa, England, assignor to Automotive Products Limited

Filed May 25, 1976, Ser. No. 689,842

Claims priority, application United Kingdom, June 5, 1975, 24329/75; Oct. 15, 1975, 42118/75

Int. Cl.² B60T *8/24*

U.S. Cl. 280—88 **7 Claims**



1. In a vehicle having a body supported by a resilient suspension system, a first wheel on one side of the vehicle and a second wheel on the other side of the vehicle, a first suspension component which moves with vertical movement of the first wheel relative to the vehicle body during vehicle cornering and a second suspension component which moves with vertical movement of the second wheel relative to the vehicle body during vehicle cornering, a fluid pressure braking system which comprises:

a driver-controlled source of fluid pressure;

a first brake operative to brake said first wheel;

a second brake operative to brake said second wheel;

a first brake actuator acting on said first brake;

a second brake actuator acting on said second brake;

a first fluid pressure modulating valve connected between the driver-controlled source and said first brake actuator;

a second fluid pressure modulating valve connected between the driver-controlled source and said second brake actuator;

and a control mechanism responsive to vehicle suspension movements during vehicle cornering to modify the performance of one of the modulating valves so that any pressure which acts in the brake actuator associated with the inboard of said first and second wheels is lower than any pressure which acts in the brake actuator associated with the outboard of said first and second wheels, said control mechanism comprising a valve loading element operable on each of said modulating valves and a cross-linkage including a first spring connecting the valve loading element to said first suspension component and a second spring connecting the valve loading element to said second suspension component to provide a controlling biassing load on the valve loading element which is proportional to and in the same sense as differences in the vertical positions, relative to the vehicle body, of the first and second wheels.

4,030,772
FRAME

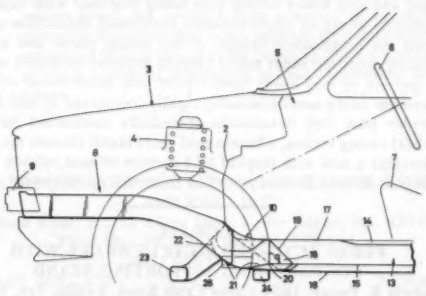
Friedrich Jacob, Steimke, and Dieter Morsch, Braunschweig, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Oct. 21, 1975, Ser. No. 624,571

Claims priority, application Germany, Oct. 25, 1974, 2450763

Int. Cl.² B62D *21/00*

U.S. Cl. 280—106 R **7 Claims**



1. A frame for a vehicle, particularly a motor vehicle, the frame having

a. means forming two side members each extending between a respective front wheel and rear wheel of the vehicle;

b. means forming two longitudinal members arranged in at least one end region of the vehicle, said longitudinal members, throughout at least portions of their lengths, being laterally displaced with respect to the side members in the direction toward the longitudinal axis of the vehicle, said longitudinal members having downwardly inclined ends;

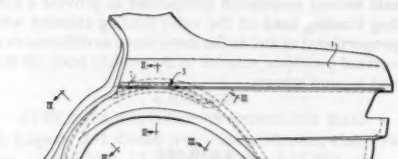
c. means forming a central longitudinal propeller shaft tunnel;
d. means forming two cross members which extend in opposite directions from said longitudinal propeller shaft tunnel of the vehicle, said cross members having projecting portions extending into said end region of the vehicle and supporting said downwardly inclined ends of respective ones of said longitudinal members;
e. means forming a bottom plate extending from said tunnel to each of said side members; and
f. said cross members being force-transmittingly connected with said tunnel, with the corresponding side members, and with said bottom plate, and being provided with attachments for supporting an axle mount.

4,030,773

FENDER, ESPECIALLY REAR FENDER FOR PASSENGER MOTOR VEHICLES

Rudolf Meixner, Sindelfingen, and Günter Kling, Boblingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed June 9, 1975, Ser. No. 584,861
Claims priority, application Germany, June 12, 1974, 2428477
Int. Cl.² B62D *25/16*
U.S. Cl. 280—153 R **13 Claims**



1. In a fender construction for a wheeled vehicle having a body of the type including wheel casing means, an improved fender construction comprising an upper fender part non-detachably connected to said vehicle, a separate lower fender part detachably connected to said vehicle, said upper fender part and said lower fender part being disposed with adjacent portions along an approximately horizontal separation plane over the longitudinal length of the fender parts, and an inwardly disposed sheet metal closure member arranged within a portion of said lower fender part, said sheet metal closure member being non-detachably rigidly connected to said lower fender part and detachably threadedly connected to said wheel casing means, wherein said sheet metal closure member provides a seal with respect to a portion of said vehicle body such as to seal the body portion from the environment.

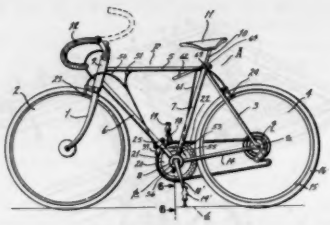
4,030,774

PEDAL ACTUATED BICYCLE BRAKE WITH COORDINATING SUPPORTING STAND

Edwin E. Foster, 1801 Camp Craft Road, Austin, Tex. 78746

Filed Feb. 6, 1975, Ser. No. 547,574
Int. Cl.² B62M *1/02*; B62L *5/10*
U.S. Cl. 280—261 **24 Claims**

1. For use with a bicycle having a frame, front and rear wheels supported on said frame, a pedal crank assembly with a main shaft and pedal cranks, and front and rear wheel caliper brakes, a brake control assembly comprising an elongated latch link disposed proximate said main shaft and having forward and rearward end portions, a lever arm having opposed ends, said lever arm being swingably mounted at one of its ends on said frame, said lever arm at its other end being pivotally engaged to the forward end portion of said latch link whereby the latter is permitted limited movement in a direction generally mounted of said bicycle by virtue of the swingable mounting of said lever arm, means connecting said front and rear brakes to said lever arm between its ends, means urging said lever arm forwardly from its swingable mounting when said brakes are in non-braking condition, a cam provided on said latch link in its rearward portion, cam support means mounted on said main shaft for rotation thereabout, at least one cam follower mounted on said cam support means for movement therewith, said cam and cam follower being



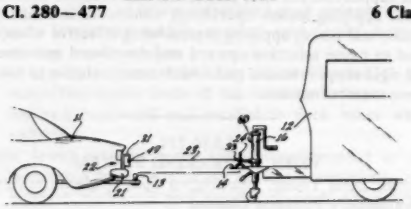
unengaged during forward pedaling of said bicycle, said cam and said cam follower being engageable upon back pedaling of said bicycle whereby said latch link is caused to move in said generally rearward direction causing tension to be placed upon said brake connecting means thereby effecting braking action, and means engaged to said latch link for disengaging said cam and cam follower to release the bicycle from braked condition.

4,030,775

APPARATUS FOR ALIGNING HITCHES OF TOWING AND TOWED VEHICLES

John C. Hill, Carmichael, Calif., assignor to Pro-Tec Industries, La Habra, Calif.

Filed Jan. 2, 1976, Ser. No. 646,187
Int. Cl.² B60D *1/14*
U.S. Cl. 280—477 **6 Claims**



1. In a tow car, having on its rear end a first coupling unit connectable to a complementary second coupling unit on the front end of a trailer, apparatus on the tow car operable to signal to the tow car driver in order to guide him while backing up the tow car to bring its coupling unit into position to hook up to the trailer's coupling unit, said apparatus comprising:
a housing mounted on said tow car;
a spool body;
first means for mounting within said housing said spool body to pivot about a horizontal and a vertical axis;
a flexible member retractably wound within said spool body;
a second means formed on the end of said flexible member;
a third means mounted on said trailer and adapted to be coupled to said second means;
fourth means mounted on said first means to indicate when said spool pivots about said vertical axis; and
fifth means mounted on said housing adjacent said first means to indicate when said flexible member is fully retracted within said spool body; wherein:
said first means comprises a first U-shaped yoke having a spool body pin mounted within said first yoke;

said fourth means comprises a potentiometer having a body and a rotatable shaft therein;

said rotatable shaft fixedly mounted to said first yoke substantially at the center thereof so that said first yoke and said spool body depend therefrom.

4,030,776

FAIRLEAD AND IMPLEMENT HITCH AND METHOD OF IMPLEMENT RETRIEVAL

William H. Bricknell, St. Thomas, and Gerald N. Sunderlage, London, both of Canada, assignors to Clark Equipment Company, Buchanan, Mich.

Filed Mar. 19, 1976, Ser. No. 668,774

Int. Cl.² B60D *1/18*

U.S. Cl. 280—477 **7 Claims**

1. In a vehicle adapted for towing an implement having a drawbar, said vehicle having a pair of side frames, the combination comprising a power winch, a length of cable wound upon the winch which is adapted to be paid out from the rear of the vehicle and retracted by the winch, a horizontal roller supported between the side frames and mounted behind the winch which provides an anti-friction surface for paying out and retracting the cable, and a hitch on the rear of the vehicle frame situated with respect to said cable to cause the implement drawbar, when pulled by the winch, to be brought into abutting engagement with the vehicle, said hitch including an opening in the vehicle frame, said opening comprising a pair of vertically extending slots, one in each of the side frames, the slots being provided in a vertical plane tangent to the surface of said roller and being accessible from the bottom and adapted to receive portions of the implement drawbar in hitching relationship.

4,030,777

VEHICLE SUSPENSION SYSTEM

Karl Rabenseifner, Pappenheim, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of Ser. No. 502,824, Sept. 3, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,718

Claims priority, application Germany, Sept. 22, 1973, 2347793; Dec. 20, 1973, 2363443

Int. Cl.² B60G *11/26*

U.S. Cl. 280—714 **21 Claims**

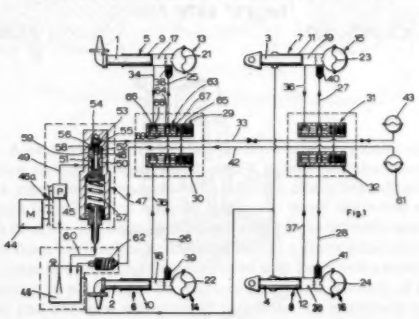


Fig 1

1. A suspension system for a vehicle having a frame, a plurality of wheels and at least two axles mounting the wheels comprising:

a. means defining a source of fluid under pressure;

b. a plurality of fluid suspension means, each coupled to the vehicle frame and to a wheel of the vehicle, different fluid suspension means being coupled to different wheels, each fluid suspension means including:

i. a cylinder, and

ii. a piston mounted for reciprocating movement in the cylinder, the cylinder and a face of the piston defining a pressure chamber in the cylinder;

c. a supply line coupled to the source of fluid for conducting fluid under pressure from the source of fluid toward the fluid suspension means;

d. a return line coupled to the source of fluid for conducting fluid away from the fluid suspension means to the source of fluid;

e. means for maintianing a residual fluid pressure in the return line; and

f. a system of conduits coupled to the fluid suspension means, the supply line and the return line so as to define an integrated system of fluid flow path, the conduit system including:

i. a pressure line for each flud suspension means, each pressure line communicating with the supply line and with the pressure chamber of a fluid suspension means and thereby being adapted to deliver fluid under pressure from the supply line to said pressure chamber, and

ii. a control line for each of at least one of the fluid suspension means, each control line communicating with the return line and with the pressure chamber of a fluid suspension means and thereby being adapted to conduct fluid away from said fluid suspension means toward the return line, the control line maintaining constant communication with the pressure chamber of said fluid suspension means only when the piston of said fluid suspension means is in a position relative to the cylinder of said fluid suspension means corresponding to a vertical position of an associated wheel of the vehicle relative to the frame of the vehicle lower than a predetermined level, said communication between the pressure chamber of said fluid suspension means and the control line being interrupted by the piston of said fluid suspension means when said piston of said fluid suspension means is in a position relative to the cylinder of said fluid suspension means corresponding to a vertical position of said associated wheel relative to the frame of the vehicle which is higher than said predetermined level, the residual fluid pressure being maintained in the return line being equal to a predetermined minimum fluid pressure in the pressure chamber of said at least one fluid suspension means, neglecting flow losses.

4,030,778

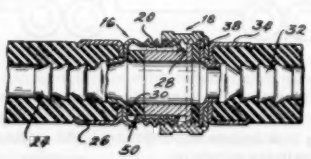
LEAKPROOF COUPLING MEANS FOR GARDEN HOSES AND THE LIKE

William Kaut, Jr., 12 Alden Lane, Creve Coeur, Mo. 63141

Filed May 19, 1975, Ser. No. 578,473

Int. Cl.² F16L *33/20*

U.S. Cl. 285—174 **7 Claims**



1. Improved means for the leak-proof coupling together of male and female threaded members including a tubular male threaded member having a passage therethrough, a surface on one end of said member and external threads thereon, said

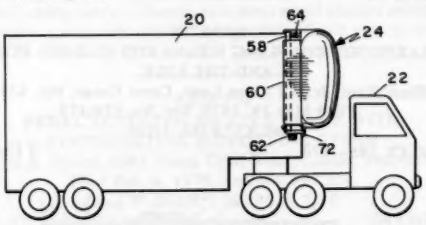
end surface on the male member extending inwardly to define an opening into the male member that is smaller in diameter than the diameter of the passage therethrough, a tubular female threaded member having internal threads adapted to be cooperatively engageable with the external threads on the male member and an edge surface on one end thereof, means forming an annular flange on the male threaded member extending radially into the passage therein at a location spaced from the end surface, means forming an annular inwardly extending ledge on the female member at a location spaced from the end edge surface thereon, said flange and said ledge extending radially inwardly to define openings in the respective male and female members that are smaller in diameter than the diameter of the opening into the male member defined by the end surface thereon, said flange and said ledge being located in spaced and opposed substantially parallel relationship to each other on opposite sides of the threads on the male and female members when the threads on the respective members are cooperatively engaged, said means comprising a resilient tubular member having an outer side wall at least a portion of which is of approximately the same diameter as the diameter of the opening into the male member defined by the end surface thereon, said resilient member being insertable to extend through the opening defined by the end surface on said male member and into the passage therein with the end surface on said male member acting as a guide during insertion and engaging the outer side wall of the resilient member to provide support therefor, at least a portion of the resilient member inserted into the passage in said male member having a smaller outer diameter than the diameter of the passage in said male member so as to form an air space around the resilient member in the passage in the male member, and said resilient member having spaced apart substantially parallel, radial, end surfaces thereon which are spaced apart a distance at least equal to the length of the threads on one of said members and sufficiently to simultaneously resiliently sealably engage the annular flange and the annular ledge when the male member is partly threaded into the female member, and sufficiently so that any further threading of the male member into the female member thereafter causes said resilient member to be axially compressed to improve the sealed condition between the resilient member and the male and female members.

4,030,779

INFLATABLE STREAMLINING STRUCTURE FOR VEHICLES

David W. Johnson, 1884 Sunset Blvd., San Diego, Calif. 92103

Filed Mar. 18, 1976, Ser. No. 668,327
Int. Cl.² B62D 35/00
U.S. Cl. 296—1 S 10 Claims



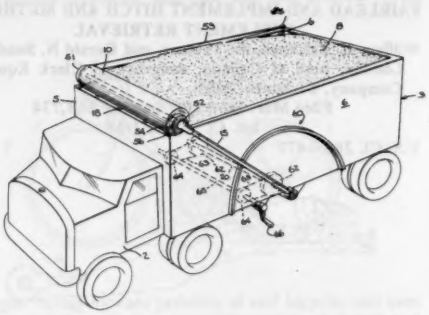
1. A structure for streamlining vehicles comprising:
a. an inflatable body comprising when inflated a substantially continuous tube defining the perimeter of said streamlining structure;
b. a substantially continuous skirt attached to the perimeter of said inflatable body and attachable to the sides of a vehicle adjacent one end thereof to define a substantially continuous fairing between said one end of said vehicle and said inflatable body when the latter is inflated.

4,030,780

COVER ASSEMBLY

Raymond H. Petretti, Whitestone, N.Y., assignor to Toneray Covers, Inc., Whitestone, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,498
Int. Cl.² B60P 7/02
U.S. Cl. 296—100 18 Claims



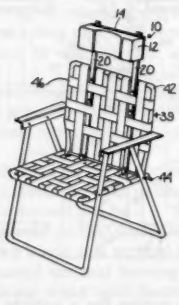
1. A cover assembly for an open body comprising a flexible cover having first and second ends, a rotatable rod at one end of the open body, the first end of said cover being anchored to the one end of said open body, the second end of said cover being attached to said rod and said cover being rolled around said rod, the rod being movable from one end of the open body to the other end of the open body, means for rotating said rod to unroll the cover, means for anchoring the first end of the cover to one edge of the open body, said means for rotating said rod comprising at least two pulleys mounted on the rotatable rod, one of said pulleys having a cable attached at one end to said one pulley and anchored at its other end to one end of the open body and the other of said pulleys having a cable attached at one end to said other pulley and anchored at the other end to the other end of the open body, said rod being mounted on an arm pivoted to the open body and means to swing said arm back and forth along the side of the open body, whereby movement of the arm and thus the rod from one position to the other will wind the cable around one of the pulleys and simultaneously unwind the other cable from the other pulley thereby causing the rod to rotate.

4,030,781

HEADREST

Harold P. Howard, 8451 W. Ten Mile Road, Oak Park, Mich. 48237

Filed Jan. 21, 1976, Ser. No. 651,031
Int. Cl.² A47C 7/36
U.S. Cl. 297—397 3 Claims



1. A headrest and lawn chair combination comprising:
a pillow;

a support plate fixedly attached to said pillow and generally conforming to the shape of said pillow;

two upper longitudinal members positioned substantially parallel to each other, each one of said upper members having a pillow attaching end and an opposite lower end;

means carried by said plate to releasably attach said upper members to said plate at said pillow attaching end of each of said upper members;

two lower longitudinal members, each one of said lower members having a chair attaching end and an opposite upper end;

means releasably and adjustably joining said lower end of each of said upper members to said upper end of each of said lower members permitting a selected range of total lengths for the resulting combination;

U-shaped attaching elements formed on the chair attaching ends of each of said lower members, said elements each having a base section carried by said lower members and downwardly disposed legs;

a lawn chair having a horizontally disposed seat frame and an upright, U-shaped back frame, said back frame having an upper base section and downwardly disposed legs, the ends of which are pivotally connected to said seat frame;

a horizontally disposed connecting rod pivotally connecting said back frame legs to said seat frame;

means supporting said seat and back frames, respectively, in said horizontal and upright positions; and

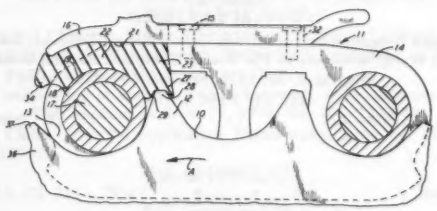
a plurality of interwoven webs carried by said back frame, said headrest upper and lower members being positioned through said interwoven webs such that a portion of said upper members abuts a forward portion of said back frame base section and said U-shaped attaching elements engage said horizontal connecting rod, said legs of each of said U-shaped attaching element being spaced a sufficient distance from each other and of a sufficient flexibility that said U-shaped attaching elements will tightly engage said horizontal connecting rod in a snap-lock fashion to securely and releasably attach said headrest to said lawn chair.

4,030,782

CRAWLER TRACTOR TRACK CHAIN DRIVE ASSEMBLY

John Merlin Baylor, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed June 25, 1976, Ser. No. 699,703
Int. Cl.² B62D *5/20*
U.S. Cl. 305—57 **8 Claims**



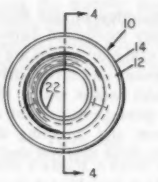
1. A crawler tractor track chain drive assembly comprising a drive sprocket having teeth and spacings therebetween, a track chain including a plurality of track chain links disposed in pairs in end-to-end relation along said track chain and with each of said pairs being two of said chain links laterally spaced apart from each other across said chain, a track plate removably attached to each of said pairs of said links and extending thereover, a plurality of connectors extending laterally of said chain and between said pairs of said links for articularly connecting said pairs of said links together in a chain arrangement, each of said connectors being spaced from an adjacent one of said plates and being disposed toward said sprocket and received in said spacings for driving engagement with said teeth, and an elastomeric member snugly disposed in the space between said connector and said plate and thereby being secured in a fixed position on said track chain and extending beyond said connector in the direction of the length of said chain to be disposed to be engaged by said sprocket teeth and thereby minimize noise created by engagement of said sprocket with said chain.

4,030,783

SELF-ADJUSTING SPHERICAL BEARING

Albert R. McCloskey, Fairfield, Conn., assignor to Heim Universal Corporation, Fairfield, Conn.

Continuation of Ser. No. 440,472, Feb. 7, 1974, abandoned.
This application June 6, 1975, Ser. No. 584,784
Int. Cl.² F16C *9/06, 23/04, 25/04, 35/06*
U.S. Cl. 308—72 **5 Claims**



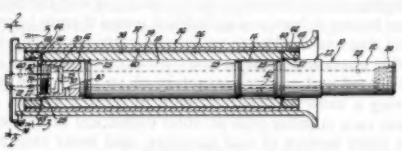
1. A spherical bearing assembly having an inner race member and an outer race member, the inner surface of the outer race member being a concave spherical bearing surface, the outer surface of the inner member being a complementary convex spherical bearing surface, the inner member including a spool member having a frusto-conical portion disposed on its outer bearing surface and at least three spherical segments, each segment having a frusto-conical depression on its inner bearing surface complementary to said frusto-conical portion, said segments disposed on and held together to form other races with said spool member by the registration of said furstoconical portion in said complementary fursto-conical depression, whereby the frusto-conical portion and depression cooperate to provide rotational redundancy and positional centering of the segments on the spool.

4,030,784

GAS BEARING ROLL SHELL ASSEMBLY WITH SELECTIVE DRIVE MEANS

Donald J. King, Huron; Loren E. Lura, Sandusky, and Ewalt Maurushat, Huron, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed June 18, 1976, Ser. No. 697,350
Int. Cl.² F16C *17/16*
U.S. Cl. 308—107 **10 Claims**



1. A gas bearing roll shell assembly for textile machinery and the like having selective drive means comprising:

an axle having an intermediate enlarged diameter portion and supply passage means having an inlet adjacent an axial end thereof adapted for connection to a source of gas under pressure,

restrictive passage means through said enlarged diameter portion leading from said supply passage means to an outer circumferential surface thereof,

a rotatable roll shell surrounding said enlarged diameter portion with a small radial clearance whereby said roll

shell is adapted to be radially supported on a layer of gas supplied from said supply passage means via said restrictive passage means,

a first thrust ring fixed on said roll shell adjacent an axial end thereof and surrounding said axle between said intermediate portion and said axial end of said axle, a second thrust ring fixed on said roll shell adjacent an opposite axial end thereof and surrounding an opposite annular end portion of said axle,

and means for selectively driving said roll shell during operation comprising a plurality of circumferentially spaced turbine buckets recessed into the bore of said second thrust ring,

first part chordal passage means in said annular end portion of said axle having first inlet means for receiving gas under pressure from said supply passage means and first outlet means aligned in the axial direction with said turbine buckets,

a valve rotatably mounted in said annular end portion of said axle for rotary movement between a neutral drive position whereat said inlet means are closed off from said supply passage means and a first drive position whereat said inlet said inlet means are in fluid communication with said supply passage means for receiving gas under pressure therefrom and directing the same onto said turbine buckets to drive said roll shell in a forward direction,

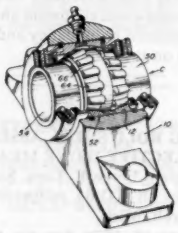
said valve further having exterior portions for manually rotating said valve between said neutral and said first drive positions during operation.

4,030,785

BEARING CARTRIDGE

Elmer D. Robinson, and Hilarius S. Struttmann, both of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 21, 1976, Ser. No. 697,814
Int. Cl.² F16C *1/24*
U.S. Cl. 308—187 **4 Claims**



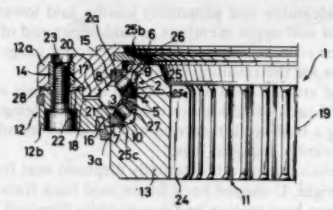
1. A bearing cartridge for use in a bearing-housing having a cylindrical bore therethrough for receiving said cartridge, said bore having at least one cylindrical recess therein to receive a snap ring and the like to retain said cartridge in said housing and in operating position, said cartridge comprising a unitary, lubricated and adjusted structure of an inner race member having a central cylindrical bore to receive a shaft and an outer race member with an outer cylindrical surface defining the outer surface of said cartridge, said inner race member having a pair of spaced raceways, said outer race member having a pair of spaced raceways each of which is radially disposed opposite a raceway of said inner race member, a set of rollers positioned between each inner and oppositely disposed outer raceway, and sealing means positioned between the inner race member and the outer race member outwardly of said sets of rollers, said sealing means retaining lubricant in said cartridge, said outer race member being constructed of multiple parts integrally joined to one another, said cartridge being insertable and removable from said housing as a unitary structure and being retained in said housing by a snap ring received in said at least one cylindrical recess in said housing.

4,030,786

MULTI-ROW ANTI-FRICTION BEARING

Wilhelm Schluter, Dortmund-Gartenstadt, and Heinz Pohler, Herdecke-Kirchende, both of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

Filed Jan. 5, 1976, Ser. No. 646,770
Claims priority, application France, Jan. 6, 1975, 75.00268; Jan. 7, 1975, 75.00381
Int. Cl.² F16C *19/04, 19/70*
U.S. Cl. 308—227 **15 Claims**



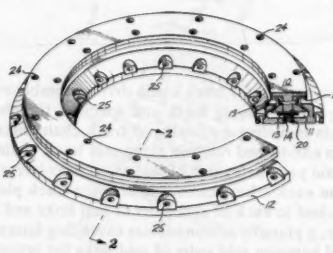
1. In an anti-friction precision bearing preloaded for absorbing simultaneously radial and axial forces and torque stresses: an annular bearing body comprising in combination an inner bearing ring and an outer bearing ring, one of said bearing rings being divided into at least two axially superimposed individual sections and having its plane of division extending transverse to the axis of said anti-friction bearing, the other one of said bearing rings being an undivided single ring, at least two annular rows of anti-friction elements arranged between said inner and outer bearing rings, at least three annular supporting wire means arranged between said inner and outer rings and forming the raceways for said rows of anti-friction elements, two of said wire means being arranged in said undivided single ring and each one of said two wire means having one raceway only, and the third one of said wire means having two raceways and being seated between two of said at least two axially superimposed individual bearing ring sections, those anti-friction elements which cooperate with the wire element having two raceways having their axes of rotation respectively extending substantially perpendicular to said last mentioned two raceways, and connecting means interconnecting said superimposed bearing sections.

4,030,787

TURNTABLE BEARING

Joseph Brogan, Kent, and Irwin Gerald Baker, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 30, 1976, Ser. No. 671,925
Int. Cl.² F16C *19/10*
U.S. Cl. 308—227 **10 Claims**



1. A turntable bearing comprising:

a lower support ring having a groove therein along the top surface of said ring extending around the circumference of said ring with said groove having an inner and outer

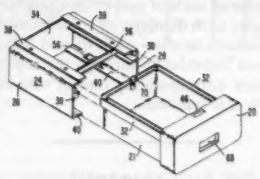
surface and a shape which is wider at its bottom than at its top;
an inner bearing having a circular ring shape adapted to fit within said groove and adapted to contact the inside surface of said groove;
an outer bearing having a circular ring shape adapted to fit within said groove and adapted to contact the outside surface of said groove;
a tee ring adapted to fit within said groove and between said inner bearing and said outer bearing;
means for securing said tee ring to said inner bearing and said outer bearing; and,
means for raising or lowering said inner bearing, said tee ring, and said outer bearing within said groove.

4,030,788

NON-EXPOSED DRAWER LOCK

Raymond A. Bleeker, Grand Rapids, Mich., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 28, 1975, Ser. No. 626,168
Int. Cl.² A47B *88/00*
U.S. Cl. 312—333 **8 Claims**



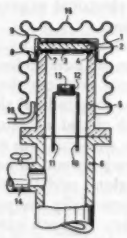
1. In combination, a drawer case, a drawer including a front panel, slidable in said drawer case and locking means for locking said drawer to said drawer case; said locking means including a locking bar and a lock, said locking bar being mounted on said drawer case for limited reciprocal motion with resect to said drawer case, said lock being mounted in the front panel of said drawer and adapted to interconnect with said locking bar; said locking means permitting limited relative slidable movement between said drawer and said drawer case while said locking bar and said lock are interconnected.

4,030,789

METHOD OF MANUFACTURING AN ELECTRIC DISCHARGE TUBE

Paulus Philippus Maria Schampers, and Pieter Adrianus De Rijke, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 583,982, June 5, 1975, abandoned.
This application Sept. 27, 1976, Ser. No. 727,049
Claims priority, application Netherlands, June 14, 1974, 7407952
Int. Cl.² H01J *9/18*
U.S. Cl. 316—19 **4 Claims**



1. A method of manufacturing an electric discharge tube of the type having, in an envelope composed of a first portion which is hermetically sealed to a second portion, a radiation sensitive layer on said first portion and a system of electrodes arranged opposite said radiation sensitive layer, comprising the steps of: forming said radiation sensitive layer on said first portion of the tube envelope in a first evacuated vessel which is temporarily closed by that first portion of the tube envelope using a liquid metal sealant of a gallium containing material, degassing the system of electrodes in a second evacuated vessel assembled of said second portion of the tube envelope and auxiliary closing member which are temporarily sealed together using a liquid metal sealant of said gallium containing material, filling said first and said second vessel with an inert gas at a pressure substantially equal to the ambient pressure on said vessels, disconnecting said first portion of the tube envelope from said first vessel and transporting said first portion to said second vessel, whereby the inert gas protects the radiation-sensitive layer on said first portion from exposure to the atmosphere during the transfer step, disconnecting the auxiliary closing member from said second vessel, sealing said first portion to said second portion of the tube envelope using a liquid metal sealant of said gallium containing material and evacuating the tube.

4,030,790

PROCESS FOR FABRICATING LENSES FOR MANUFACTURING CATHODE RAY TUBE SCREEN STRUCTURES

G. Norman Williams, and Thomas W. Schultz, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 15, 1976, Ser. No. 723,233
Int. Cl.² H01J *9/42*
U.S. Cl. 316—23 **8 Claims**

1. In manufacturing color cathode ray tube screen structures, a lens fabricating process utilizing optical scanning exposure apparatus having a positionally locatable light beam source comprising the steps of:
selecting a matrix of data points on the viewing screen of a cathode ray tube;
altering the positional location coordinates of said light beam source of said optical scanning exposure apparatus to effect light beam impingement at each of said data points;
recording said altered positional location coordinates of said optical scanning exposure apparatus;
constructing a cathode ray tube having a viewing screen structure with a field of phosphor elements fabricated in accordance with said altered position location coordinates of said optical scanning exposure apparatus;
measuring the error of impingement of an electron beam on said elements of said phosphor field at said viewing screen of said cathode ray tube;
varying said recorded altered positional location coordinates of said optical scanning exposure apparatus in accordance with said measured error of impingement; and
submitting said varied positional location coordinates of said optical scanning exposure apparatus to a lens design program to provide lens manufacturing information.

4,030,791

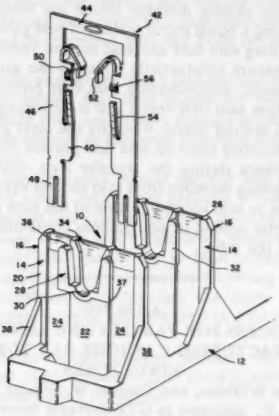
ELECTRICAL CONTACT SYSTEM

Wilmer Lee Sheesley, Dauphin, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 6, 1976, Ser. No. 712,309
Int. Cl.² H01R *39/00*
U.S. Cl. 339—5 M **2 Claims**

1. An electrical contact system for supplying a current from a circuit board to a motor suspended between two walls which comprises:
a. two pair of conductive contact members with one member of each pair being the mirror image of the other

member, each contact member positioned over an edge of an opposing surface of said walls and having an elongated body with contact means on its lower end adapted to electrically engage a circuit on a circuit board and on the upper end a cantilever spring arm extending generally in a curving manner from the body so that the arm's free end projects downwardly, said free end being arcuate and facing the arcuate free end of the contact member position near the other side of the same wall; and



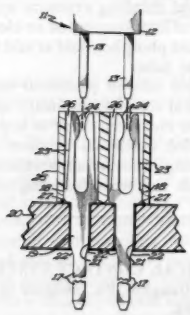
b. two pair of conductive collet tabs each having a cylindrical tube section and a strap extending laterally from the base of the cylindrical tube section each pair of collet tabs being positioned on opposite ends of the motor with electrical wires therefrom being fixed to said straps so that when the motor is suspended between the two walls said cylindrical tube sections are received in the arcuate free ends of the cantilever spring arms whereby an electrical current may pass from the circuit board to the motor.

4,030,792

TUNING FORK CONNECTOR

Charles Floyd Fuerst, Brooklyn Park, Minn., assignor to Fabri-Tek Incorporated, Minneapolis, Minn.

Filed Mar. 1, 1976, Ser. No. 662,802
Int. Cl.² H05K *1/08*
U.S. Cl. 339—17 LC **5 Claims**



1. A female connector for connection to blade type male contacts, comprising:

a. a planar mounting substrate;

b. said planar mounting substrate containing a plurality of receiving holes;

c. a plurality of female contacts, each of said female contacts including a neck portion and a connector portion, each of said female contacts being press-fitted into a corresponding one of each of said receiving holes with said neck portion of each of said female contacts abutting the walls of a corresponding one of said receiving holes into which it is inserted;

d. an insulative housing covering each of said female contacts at least partially, said insulative housing containing a plurality of entry chambers, each of said entry chambers having a bottom portion and a top portion;

e. each of said entry chambers extending individually through said insulative housing and having a cross-shaped cross section in planes parallel to said mounting substrate with each of said cross sections being comprised to two intersecting cross members with one of said cross member being sized to accommodate the width of one of said female contacts inserted therein, and the other cross member being sized to accommodate the width of a male contact blade which may be inserted therein;

f. each of said entry chambers having isoplanar walls along its length to allow said insulative housing to forceably slide over said female contacts generally without interference with the contour of each of said female contacts which would prevent such sliding; and

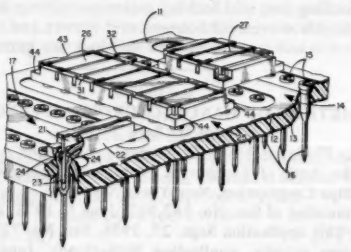
g. the diameter of each of said entry chambers being generally the same as th diameter of corresponding ones of said female contacts to allow each of said female contacts to be removed individually through the top or bottom portion of each corresponding one of said entry chambers into which it is inserted.

4,030,793

ELECTRONIC PROGRAMING JUMPER PINS AND DUAL-IN-LINE ASSEMBLY THEREOF

Richard J. Hanlon, Attleboro, Mass.; Neil F. Damon, Manville, and Herbert G. Yeo, Lincoln, both of R.I., assignors to Augat, Inc., Attleboro, Mass.

Filed June 30, 1975, Ser. No. 591,438
Int. Cl.² H01R *31/08*
U.S. Cl. 339—19 **15 Claims**



1. A programming jumper pin assembly for electrically interconnecting selected holes in a dual-in-line array of holes in a substantially flat electrical printed circuit panel board, said assembly comprising:

an insulator of generally flat, rectangular configuration having a pair of spaced parallel longitudinal slots cut into one flat side thereof adjacent the longitudinal edges of said insulator, said longitudinal slots extending substantially the full length of said insulator, a plurality of spaced parallel transverse slots cut into said flat side, each said transverse slot being normal to and intersecting both of said longitudinal slots, said longitudinal and transverse slots being of substantially the same width, and a hole through said insulator at each intersection of one of said longitudinal slots with one of said transverse slots; and

an electrically conductive jumper pin having at least two elongated spaced parallel contacts interconnected at

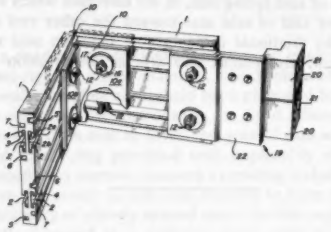
respective one ends thereof by a cross bar, said cross bar residing in one of said longitudinal and transverse slots in said insulator, the other ends of said contacts projecting through said holes in said insulator and being adapted to enter and electrically interconnect at least two holes in said dual-in-line array of holes in said panel board.

4,030,794

BUS BAR AND SWITCHBOARD ASSEMBLAGE

Gustave Rozenboom, Kokomo, and Bernard C. Rickmann, Peru, both of Ind., assignors to Square D Company, Park Ridge, Ill.

Continuation of Ser. No. 512,671, Oct. 7, 1974, abandoned, which is a continuation of Ser. No. 388,179, Aug. 14, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,386
Int. Cl.² H01R 9/22
U.S. Cl. 339—22 B 7 Claims



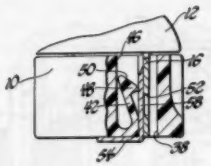
1. A bus bar comprising an elongated rigid extruded one piece body of electrically conductive material and of a cross section which is substantially a right angled parallelogram throughout its entire length, each of the faces of the body being planar throughout its entire length and width, and at least two opposite faces being relatively wide and identical with each other; said body having a pair of identical parallel slots of T-shaped cross section extending the full length thereof and disposed with the T-leg portions intersecting said opposite faces, respectively, of the body, and with the T-head portions parallel to said opposite faces, respectively, of the body; said slots further being positioned endwise of the elongated cross section relative to the longitudinal axis of the body so that upon rotation of the body 180° about said axis each said slot will occupy the same position and have the same orientation that the other slot occupied and had, respectively, prior to said portion of the body; and thereby to provide flat, continuous relatively wide electrical contact surfaces coextensive in length and width with said opposite faces, respectively, in all rotated positions of the body about its longitudinal axis; said body having a second pair of T-slots identical,. respectively, with the T-slots of the first mentioned pair; the T-slots of said second pair being positioned at said opposite faces, respectively, and each T-slot of each pair being diametrically opposite, relative to said axis, to a T-slot of the other pair, and said diametrically opposite slots being equidistant from said axis, so that upon rotation of the body 180° about its longitudinal axis the slots at one face will occupy the same position and have the same orientation that the slots at the opposite face had prior to said rotation, and each slot of each pair being identical with the diametrically opposite slot of the other pair; the T-slots of each pair being at opposite sides of the longitudinal axis from the other pairs being spaced equidistantly from said axis, said body cross section being rectangular and of a width several times its thickness, and further having parallel grooves, each parallel with the slots and each having parallel entry side walls which are perpendicular to the planes of said faces of the body, at least one side wall of each groove having parallel alternate ribs and valleys extending endwise of the associated groove for threaded engagement with bolts; said grooves being open through said opposite faces of the body, and being parallel to the axis of the body.

4,030,795

LOCKING DEVICE FOR ELECTRICAL PLUGS

John A. Niemann, 2056 Wilshire Drive SE., Grand Rapids, Mich. 49506

Filed Mar. 5, 1976, Ser. No. 664,197
Int. Cl.² H01R 13/44
U.S. Cl. 339—37 6 Claims



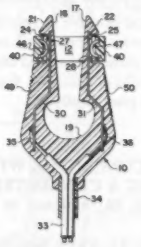
1. A locking device for use with electrical plugs having extended terminals with holes provided in the ends thereof, and comprising; a body member having slots provided therein and which are receptive of the entended terminals of an electrical plug, a first means provided within said body member and biased to extend within said slots for latching engagement with said terminals upon the alignment of the holes in the ends of said terminals therewith, and a second means for holding said first means in a retracted disposition and allowing for the disassociation of said terminals from said body member, said second means being separate and apart from said body member and formed for insertion in said slots and to extend relatively between said terminals and said first means.

4,030,796

ELECTRICAL CONNECTOR

Michael D. Patzer, Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed Jan. 16, 1976, Ser. No. 649,622
Int. Cl.² H01R 13/62
U.S. Cl. 339—61 R 14 Claims

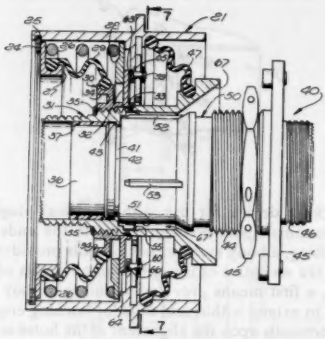


8. A male electrical connector comprising: a base portion, at least two substantially parallel resilient prongs extending from the base portion, a notch having a bottom portion defined in the outer side portion of each prong, at least one electrical conductor positioned within a prong and exposed at the bottom portion of the notch defined therein, and outwardly facing inclined surfaces defined between the terminus of each prong and the notch defined therein, the inclined surfaces extending to the terminus of each prong and being in a diverging relationship from the termini of the prongs to the notches defined in the prongs with the greatest distance between the termini of the prongs in the undeformed condition being less than the distance between the bottom portions of the notches.

4,030,797
ELECTRICAL CONNECTOR

Gerald R. Nieman, Phoenix, Ariz., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 585,878, June 11, 1975. This application July 12, 1976, Ser. No. 704,316
Int. Cl.² H01R 13/62
U.S. Cl. 339—64 M 1 Claim

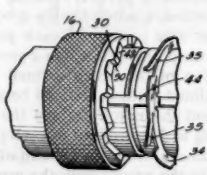


1. An electrical connector comprising: a housing having an approximately symmetrical longitudinal axis therethrough and having an opening completely therethrough; a contact carrying plug shell; a guidance plate having a pair of slots therein, said guidance plate having an approximately rectangular hole therein surrounding said plug shell, said plug shell having undersize parallel flats on opposite outside surfaces thereof at said guidance plate location to rotate therewithin; a pair of guide pins substantially fixed to said housing on opposite sides thereof, said pins being located in respective ones of said slots, said slots extending generally in a line normal to the lengthwise dimension of said guidance plate hole; a forward rubber bellows fixed between said housing and said plug shell covering said guidance plate at the forward end of said housing; a retaining ring fixed to the other end of said housing; a rear spring plate bearing against said retaining ring forward thereof; a front spring plate forward of said rear spring plate inside said housing; a helically coiled spring in compression between said rear and front spring plates, said housing having a shoulder to limit forward movement of said front spring plate; a shell plate fixed relative to said plug shell, said housing having an annular recess forward of said front spring plate, said shell plate being slidable on said front spring plate in said recess; and a rear rubber bellows fixed between said rear spring plate and said plug shell.

4,030,798
ELECTRICAL CONNECTOR WITH MEANS FOR MAINTAINING A CONNECTED CONDITION

Alfred Paoli, Chicago, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Apr. 11, 1975, Ser. No. 567,273
Int. Cl.² H01R 13/54
U.S. Cl. 339—89 R 3 Claims

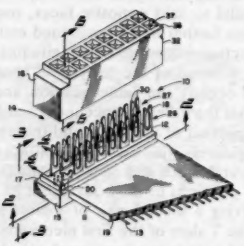


1. An electrical connector comprising a plug shell, a receptacle shell, a coupling nut for interconnecting said shells, said coupling nut being mounted for rotation on one of said shells and having threads adapted to cooperate with corresponding threads on the other of said shells, said coupling nut having a plurality of ratchet teeth extending therefrom, said ratchet teeth each having a forward face and a rearward face formed at different angles relative to a plane normal to the axis of rotation of said coupling nut, and an elongate spring arm mounted on one of said shells and urged into contact with said ratchet teeth, said arm comprising an intermediate portion and a hooked free end terminal portion, said hooked terminal portion bearing against one of the forward and rearward faces of said ratchet teeth for impeding but not preventing rotation of said coupling nut in its uncoupling direction while maintaining rotation of said coupling nut in its coupling direction substantially unimpeded, said forward face being formed at a lower angle than said rearward face, relative to a plane normal to the axis of the coupling nut, and when said coupling nut is turned during coupling, said forward face moves, relative to the free end of said spring arm, in the direction which extends from the free end of said arm toward the other end of said arm, whereby frictional forces acting between said ratchet teeth and said arm places said arm in compression during coupling.

4,030,799
JUMPER CONNECTOR

John T. Venaleck, Painesville, Ohio, assignor to A P Products Incorporated, Painesville, Ohio

Filed Feb. 9, 1976, Ser. No. 656,303
Int. Cl.² H01R 9/08
U.S. Cl. 339—99 R 18 Claims



1. A multiconductor electrical cable termination, comprising:

a multiconductor electrical cable including a plurality of conductors and electrical insulation about said conductors maintaining the latter electrically insulated from each other,

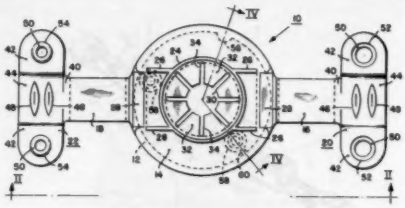
a plurality of electrical contacts, each including terminal means connecting at least one of said conductors directly through said electrical insulation to form an electrical junction, and contacting means on each of said contacts for electrically connecting each of said contacts to an external member placed to engagement therewith, and

a housing including base means for directly holding said contacts and said cable in relatively fixed position, said base means comprising a body integrally molded about at least a portion of each of said contacts and a portion of said cable, whereby said base means, said contacts and said cable form an integral structure.

4,030,800
CONNECTOR CAP WITH CORD GRIP

John Vidoni; Bhartoor Lingaraju, and John C. Timmins, all of Allentown, Pa., assignors to Square D Company, Park Ridge, Ill.

Continuation of Ser. No. 546,330, Feb. 3, 1975, abandoned.
This application Mar. 4, 1976, Ser. No. 663,860
Int. Cl.² H01R 13/58
U.S. Cl. 339—107 1 Claim



1. In a dead front electrical connector cap integrally molded of a semi-rigid dielectric material, a back plate comprising

A. a wall extending across said back plate and having a hole therein for accommodating a cord threaded there through from rear to front, the area of said wall defining said hole being provided with a plurality of angularly spaced very narrow recesses extending radially outward from the center of said hole thereby to form of said area a plurality of closely spaced apart flexible segments normally disposed in a common plane with said wall and resiliently deflectable out of said common plane, said very narrow recesses having a width substantially less than the width of said flexible segments, said relatively wide segments and said very narrow recesses therebetween providing a flexible structure to define a variable diameter aperture which also provides an effective barrier against entry of foreign matter,

B. a pair of arms connected to and extending from diametrically opposite areas of said wall, and

C. a pair of clamp parts respectively connected to and carried by said arms, said arms being connected to said wall for being disposed in rearwardly converging relation, with said clamp parts disposed in embracing relation to said cord for being secured together and thereby clamping said cord therebetween.

4,030,801
ELECTRICAL CONNECTOR JUNCTION FOR CARPETED FLOOR

Edward Dennman Bunnell, Palm Harbor, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

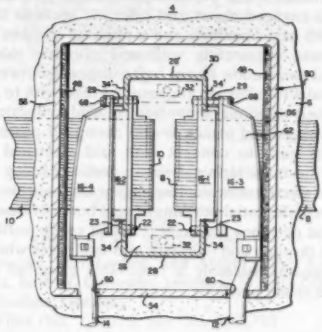
Filed Aug. 24, 1976, Ser. No. 717,317
Int. Cl.² H02G 3/08, 3/10
U.S. Cl. 339—121 5 Claims

1. Electrical junction means on a carpeted floor for first and second flat cables which extend along said floor and underneath the carpeting means on said floor, said cables having first and second multi-compact electrical connectors on their ends, each of said connectors having a mating side and a rearward side, said cables extending to said rearward sides, said junction means comprising:

a base frame member comprising a flat sheet metal base plate disposed on said floor, said base plate having upwardly extending sidewalls extending from two opposite edges thereof, said sidewalls having flanges extending inwardly from their upper edges toward each other and parallel to said base plate, each of said sidewalls having mounted ears extending inwardly from its vertically extending side edges,

said connectors extending between, and being secured to, said mounting ears in back-to-back relationship with said mating sides facing in opposite directions and away from each other, said cables extending from said rearward sides of said connectors and being reversely flexed, said cables extending across said floor away from said base frame member,

said carpeting having a first slit therein and having at each end of said first slit additional slits extending normally of said first slit in opposite directions, said first slit and said additional slits forming an opening in said carpeting and a pair of flaps on opposite sides edges of said opening,



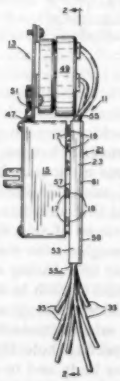
said sidewalls extending through said opening, said flaps extending upwardly from said floor and being supported on said flanges,

a cover member extending over said flaps, said cover member having depending cover sidewalls, fastening means extending through said cover member and into said flanges, said fastening means serving to clamp said cover member against said flaps and to clamp the free edges of said cover sidewalls against portions of said carpeting which are adjacent to said base frame member.

4,030,802
TERMINAL BLOCK ASSEMBLY AND MULTIPLE CONNECTOR ASSEMBLY THEREFOR

David C. Lennon, Morrison, Ill., and Richard A. Wandler, Clinton, Iowa, assignors to General Electric Company, Fort Wayne, Ind.

Filed Dec. 29, 1975, Ser. No. 645,045
Int. Cl.² H01R 33/72
U.S. Cl. 339—192 R 16 Claims



1. A multiple connector assembly adapted to be removably mounted to a plurality of male terminal spade portions comprising a casing having at least one face; a plurality of female terminals in said casing and respectively including an integral strip of electrical conductive material having a generally cylin-

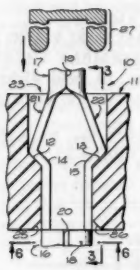
dric section at one end thereof, a bore within said cylindric section having a generally continuous circumferential portion crosswise of said strip for electrical contacting engagement with the male terminal spade portion, and means adjacent the other end of the strip for electrical connection with an electrical lead; means within said casing for locating said female terminals therein including a plurality of predeterminately spaced openings with said at least one face for receiving the male terminal spade portions and having generally cylindric sidewalls engaged about said cylindric sections to align said bores with said openings, and a plurality of pairs of opposed wall means intersecting with said cylindric sidewalls, said electrical connection means being disposed between said wall means pairs for abutting engagement therewith to predeterminately limit rotational movement of said cylindric sections in said openings; and means in said casing for passing thereinto electrical leads to connect with said electrical connection means, the male terminal spade portions being received in constant electrical contacting engagement across said continuous circumferential portions of said bores irrespective of any diametral positions the male terminal spade portions may be inserted through said openings into said bores when the multiple connector assembly is removably mounted to the male terminal spade portions.

4,030,803

ELECTRICAL CONTACT AND RETENTION MEANS THEREFOR

Jack E. Langenbach, Newport Beach, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 19, 1975, Ser. No. 633,431
Int. Cl.² H01R 9/06
U.S. Cl. 339—217 S **5 Claims**



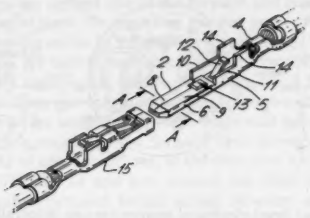
1. An electrical contact assembly comprising: an insulator body having a hole extending completely through the thickness thereof, and a shoulder on each of two opposite sides of said hole extending toward each other, said hole having different but rectangular cross sections at both of first and second opposite ends thereof, said hole having one cross sectional dimension wider at said first end than the corresponding one at said second end because of said shoulders, and a second dimension uniform throughout the thickness of said insulator body; first means in said hole having a leaf spring for each of said shoulders and a bend in each to snap onto and to seat on said shoulders when said leaf springs are slidably inserted into said hole; and second means connected to both of said leaf springs adjacent said second hole end to abut the external surface of said insulator body and to act as a stop when said leaf springs are seated as aforesaid, said second means including a first cylinder having an outside diameter greater than said second dimension, a portion of one end of said cylinder abutting said insulator external surface, a contact being fixed to both ends of said leaf springs that are positioned at said hole first end.

4,030,804

ELECTRICAL TERMINAL

Masahiro Enomoto, Tokyo, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 13, 1976, Ser. No. 704,883
Claims priority, application United Kingdom, Aug. 7, 1975, 32967/75
Int. Cl.² H01R 13/04
U.S. Cl. 339—258 S **2 Claims**



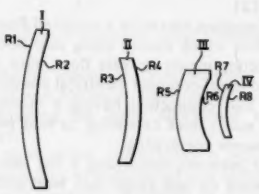
1. An electrical terminal stamped and formed from a single piece of single thickness sheet metal stock comprising a forward contact portion, a mounting portion and a rear wire connecting portion, the contact portion comprising a double thickness tab formed by folding over single thickness stock and the mounting portion being of channel section, forward ends of the channel walls being offset longitudinally of the terminal in a transition region between the contact portion and the mounting portion, one end extending forwardly of the tab rear and the other end terminating at the tab rear.

4,030,805

INFRA-RED LENSES

Philip John Rogers, Meliden, Wales, assignor to Pilkington P-E Limited, St. Helens, England

Filed Feb. 10, 1975, Ser. No. 548,587
Claims priority, application United Kingdom, Feb. 15, 1974, 7105/74
Int. Cl.² G02B 1/00, 9/34
U.S. Cl. 350—2 **24 Claims**

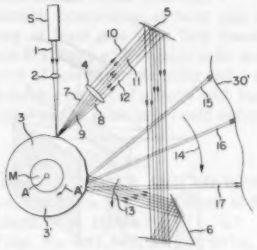


1. An infra-red lens of very high aperture greater than F/0.75 comprising from front to back in the order given at least one positive meniscus first element convex towards the front, a negative meniscus second element concave towards the front, a positive meniscus third element convex towards the front and a positive fourth element having a front surface convex towards the front, all of said elements being spaced apart.

4,030,806
SCANNING OPTICAL SYSTEM

Takeshi Goshima, Tokyo, and Noritaka Mochizuki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1975, Ser. No. 607,502
Claims priority, application Japan, Sept. 11, 1974, 49-104735
Int. Cl.² G02B *27/17*
U.S. Cl. 350—7 **28 Claims**



1. A scanning optical system for moving a light beam to cause it to scan an object, which comprises in combination:

a. a source of light for emitting a light beam;

b. first polygonal mirror means having a plurality of reflection surfaces optically disposed in confrontation to said light source, and rotating in a predetermined direction;

c. a converging optical system disposed to converge the light beam from said [light source on the reflection surfaces of said] first polygonal mirror means;

d. a collimating optical system disposed in a light path for a diverging light beam which moves angularly and repetitively in a single direction and which results from said converged light beam being reflected at said first polygonal mirror means, said system converting said diverging light beam into a unidirectionally and repetitively moving parallel light beam; and

e. second rotary polygonal mirror means having a plurality of reflection surfaces optically disposed in confrontation to said collimating optical system, wherein said second mirror means rotates at the same speed and in synchronism with rotation of said first polygonal mirror means along the moving direction of said light beam; and reflects said [reflecting a] parallel light beam formed by said collimating optical system so as to cause it to scan the object.

4,030,807
OPTICAL SCANNING SYSTEM WITH CANTED AND TILTED REFLECTORS

Douglas W. Briney, Yorba Linda, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Feb. 9, 1976, Ser. No. 656,557
Int. Cl.² G02B *27/17*; G01J *1/20*
U.S. Cl. 350—7 **9 Claims**

1. A scanning apparatus for use in an optical seeker system comprising:

a primary optic axis,

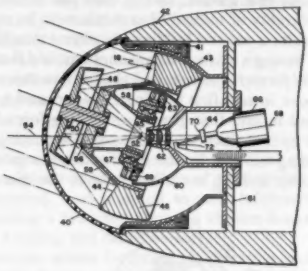
first beam director means having a reflective surface canted with respect to said primary optic axis for folding and directing incident radiation,

means for spinning said first beam director about said primary optic axis and producing a first scanning component,

second beam director means positioned for intercepting the radiation diverted by the first beam director means, said second beam director means having a spin axis tilted with respect to said primary optic axis and including a beam director surface canted with respect to said spin axis,

means for spinning said second beam director means about said spin axis of said second beam director for producing a second scanning component,

a sensor positioned to receive the radiation diverted from said second beam director,

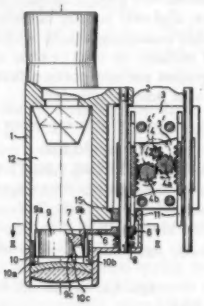


said beam director surface further folding the incident radiation to scan the radiation over said sensor.

4,030,808
BINOCULAR TELESCOPE

Joachim Hornschu, Oberkochen, and Arthur Jung, Konigsbronn, Brenz, both of, Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed Oct. 7, 1975, Ser. No. 620,392
Claims priority, application Germany, Oct. 19, 1974, 7435008[U]
Int. Cl.² G02B *21/20*
U.S. Cl. 350—36 **11 Claims**



10. A binocular telescope, comprising two telescopes each of which has its own housing with an offset arm for hinge mounting, a bridge having spaced parallel hinge elements independently connected to the respective hinge mountings of said housings, each telescope comprising its optical system including an axially movably guided focusing lens element and mount, said mount including an offset arm with a flat shoulder surface that is normal to the axis of lens-mount guidance, drive means including a manual actuator carried by said bridge, one of said hinge elements at each housing-to-bridge connection including a pin that is slidably guided on the hinge axis, said drive means having an axially displacing actuating connection to each of said pins, and spring means preloading each mount for shoulder-surface abutment with an end of the associated one of said pins.

4,030,809
OPTICAL CONNECTOR

Makoto Onishi, Kokubunji; Katsuyuki Nagano, Kokubunji; Toshiki P. Tanaka, Kokubunji; Sadao Matsuoka, Kanagawa, and Mitsuo Tanaka, Ohme, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 9, 1975, Ser. No. 594,363
Claims priority, application Japan, July 17, 1974, 49-81111
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96 C **5 Claims**

1. An optical fiber connector comprising, in combination: a first holding member having an axis, at least one first groove

extending axially in the surface of said axis, and at least one second groove extending axially in the base of the surface of said at least one first groove, said at least one second groove receiving a plurality of optical fiber sections to be connected optically therein; a second holding member extending along said axis and having a surface which contacts said first holding member and is diametrically graded at a portion thereof facing said first groove in said first holding member; and a coupling member, fitted in said first groove and being forcedly urged towards said optical fiber sections in said second groove of said first holding member by the relative displacement of said first and second holding members so that the diametrically

graded portion of said second holding member contacts said coupling member and forces said coupling member against said optical fiber sections, to thereby fixedly hold said optical fiber sections in said second groove of said first holding member, wherein said first holding member is a hollow cylinder having said first groove formed axially in the inner surface thereof and said second groove formed axially in the base of said first groove, and said second holding member comprises a central cylinder extending axially within said hollow cylinder, the outer surface of said central cylinder having said diametrically graded surface portion facing said at least one first groove in said hollow cylinder.

4,030,810

METHOD OF COUPLING LIGHT CONDUCTORS

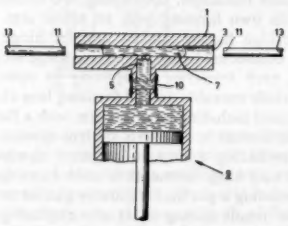
Giok Djan Khoe, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1975, Ser. No. 573,969

Claims priority, application Netherlands, May 24, 1974, 7406963

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 C **2 Claims**



1. A method of coupling light conductors using a connecting plug, having a body having a continuous longitudinal duct therethrough for receiving the conductors to be coupled, a transverse duct having a first end opening into a side wall of the longitudinal duct and a second end, and means for connecting said second end to a suction/pressure device, comprising the sequential steps of injecting a transparent liquid through the transverse duct into the longitudinal duct, inserting ends of the conductors into the longitudinal duct from opposite directions at least until they contact the injected liquid, sucking a porion of said liquid back through the longitudinal duct so as to suck said ends toward each other, such that at least a space between said ends remains filled with liquid, and sealing said transverse duct.

4,030,811

DEVICE FOR COUPLING A LIGHT SOURCE TO AN OPTICAL FIBER

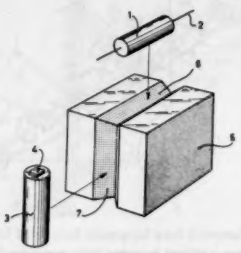
Giok Djan Khoe; Gerard Kuyt, and Adrianus Jacobus Jozef Franken, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 9, 1976, Ser. No. 675,495

Claims priority, application Netherlands, May 14, 1975, 7505629

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 C **6 Claims**



1. A device for coupling a light source to an optical fiber, comprising cylindrically-shaped supports for the light source and optical fiber respectively, a coupling-member having two substantially orthogonal V-shaped grooves the cylindrical supports being secured in the V-shaped grooves

---

4,030,812

LYOTROPIC BIREFRINGENT FILMS

Elwood L. Strebel, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 587,240, June 16, 1975. This application Apr. 16, 1976, Ser. No. 677,701

Int. Cl.² G02F *1/13*

U.S. Cl. 350—157 **5 Claims**

1. As an article of manufacture, a retarder for plane-polarized light beams consisting essentially of the transparent combination of essentially isotropic substrate and coating thereon comprising substantially colorless vitreous anisotropic birefringent residue of lyotropic nematic mesomorph.

4,030,813

CONTROL ELEMENT HAVING LIQUID LAYER ATTAINABLE TO GEOMETRICALLY UNEVEN STATE IN RESPONSE TO ELECTRICAL SIGNAL

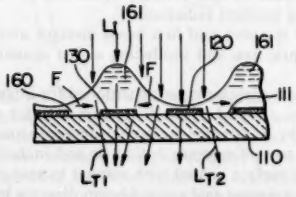
Tadao Kohashi, and Toshiharu Kurosawa, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 17, 1975, Ser. No. 641,821

Claims priority, application Japan, Dec. 20, 1974, 49-147460; Sept. 2, 1975, 50-106731

Int. Cl.² G05D *25/00*

U.S. Cl. 350—161 S **41 Claims**



1. A control element including a liquid material which is

attainable to a geometrically uneven state in response to an electrical signal, the element comprising:

a support member of a solid material;

a liquid material supported by and in intimate contact with said support member; and

means for creating in said liquid material a patterned electric field having an electric vector in a direction parallel to an interface between said support member and said liquid material, so that a portion of said liquid material makes an electroosmotic movement when said electric field is present in said liquid material;

said liquid material comprising at least one silicon compound having at least one of a first functional group having chemical affinity with organic solid material useful as the material of said substrate plate and a second functional group having chemcial affinity with inorganic solid materials useful as the material of said substrate plate.

4,030,814

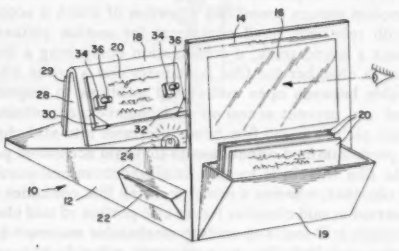
RECIPE MAGNIFIER AND VIEWER

Howard J. Clifton, and Doris V. Clifton, both of 32 Garretson Ave., Staten Island, N.Y. 10304

Continuation of Ser. No. 485,509, July 3, 1974, abandoned. This application Dec. 3, 1975, Ser. No. 637,162

Int. Cl.² G02B 27/02

U.S. Cl. 350—238 **1 Claim**



1. An improved data viewing device comprising in combination:

a frame including a generally horizontal base member with a flat undersurface and having an at least partially opened top;

a magnifier positioned on a support at the front of said base and extending upwardly and rearwardly of said base for enlarging data for a viewer;

a hollow storage rack on said magnifier support below said magnifier and positioned for holding data cards and for exposing top portions of the data cards to a viewer looking toward said magnifier for selection for viewing;

a card stand positioned rearwardly of said magnifier on said base and extending upwardly and rearwardly in a plane generally parallel to that of said magnifier;

means for removably holding an opaque data card on said stand at a lower level than said magnifier; and

light means mounted on said frame intermediate said magnifier and said card stand for illuminating said card while held on said stand.

4,030,815

HYDROSTATIC BEARING APPARATUS

Zygmunt M. Andrevski, Princeton, and Michael Jay Lurie, E. Brunswick, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,667

Int. Cl.² G02B 7/02

U.S. Cl. 350—255 **18 Claims**

8. In a system utilizing lens means interposed in the path of a beam of light to focus a spot of light on successive regions of the surface of a rotating disc; apparatus for maintaining the dimensions of the light spot focused on said successive regions substantially independent of variations, if any, in the height of said successive regions, said apparatus comprising:

a. a housing for said lens means;

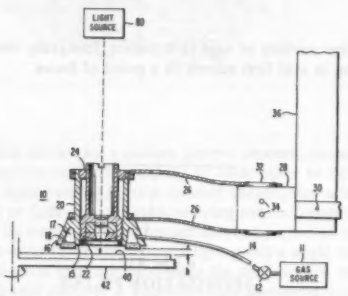
b. a support structure;

c. a movable frame mounted on said support structure for movement in a direction substantially parallel to said path of said beam of light;

d. a pressurized lubricant source;

e. hydrostatic pad means, disposed in a lower portion of said housing such that the focus of said light spot on successive regions of said surface of said rotating disc is not obstructed, and coupled to said lubricant source, for providing a lubricant film of a chosen thickness between said housing and said disc surface;

f. adjustable means for fixing an operating location for said movable frame; and



g. spring means for preloading the hydrostatic bearing formed by said lubricant film during occupancy of said operating location by said frame; said spring means comprising a first leaf spring having a first end connected to an upper portion of said housing and a second end connected to an upper portion of said frame, and a second leaf spring having a first end connected to said lower portion of said housing and a second end connected to a lower portion of said frame; said spring means also serving to orient said housing in such manner that the axis of said lens means is substantially aigned with said light path; the dimensions and characteristics of said leaf springs being such that said spring means is provided with a spring modulus which is appreciably smaller than the effective spring modulus of said lubricant film.

4,030,816

VARIABLE FOCUS RIGHT ANGLE MIRROR FOR LASER BEAM MANIPULATION

William H. Belke, and Joseph C. Hafele, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

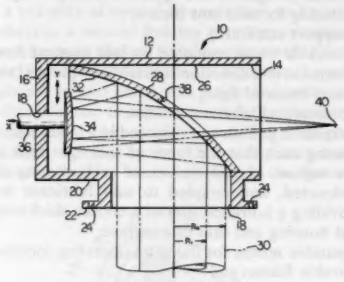
Filed Apr. 22, 1976, Ser. No. 679,420

Int. Cl.² G02B 5/10

U.S. Cl. 350—294 **4 Claims**

1. A mirror system for controlling a supply laser beam comprising a housing, an opening in said housing, a first mirror having the surface of a partial paraboloid of revolution, said first mirror having a reflective parabolic surface and being positioned to reflect the supply laser beam passing through said opening substantially 90° from the direction of travel of the supply laser beam, said first mirror having an opening disposed therein, and a second mirror disposed rearwardly of said first mirror and positioned to reflect the laser beam reflected from said first mirror through said opening in said first mirror, means for supporting said second mirror

relative to said housing, said second mirror having a reflective surface positioned to reflect the laser beam reflected from the



reflective surface of said first mirror forwardly through said opening in said first mirror to a point of focus.

4,030,817

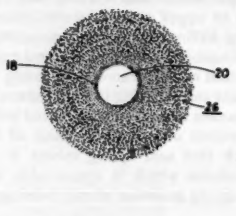
APODIZATION FILTER

William E. Westell, Weston, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 22, 1976, Ser. No. 669,354

Int. Cl.² G02B 5/22; G01J 1/56

U.S. Cl. 350—314 **8 Claims**



1. In combination with a radiometric scanning system including a scanning means, an aperture defining means, and a radiometric detector, the improvement therewith comprising an apodization filter interposed between said aperture defining means and radiometric detector, said apodization filter defining a field of view and comprising a light transmitting medium which comprises an interior portion and edges, said edges extending radially outwardly from said interior portion, said interior portion being of low and essentially uniform diffuse density such that said interior portion transmits substantially all incident light impinging thereupon, said edges having a diffuse density equal to

$$-\log \frac{1}{\sqrt{2\pi}\sigma} \int_{-\infty}^{x} e^{-\frac{1}{2}(x/\sigma)^2} dx$$

where x represents the distance towards the interior from said edges; σ, the standard deviation of a cumulative Gaussian; and e, the base e having a value of 2.718.

4,030,818

MOTION PICTURE SOUND CAMERA

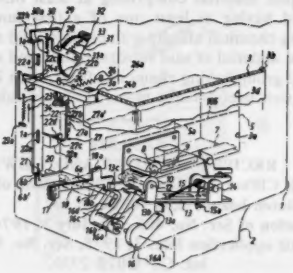
Wolfgang Geisslinger, Munich, and Peter Ungnadner, Unterhaching, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed May 8, 1975, Ser. No. 575,631

Claims priority, application Germany, May 10, 1974, 2422685

Int. Cl.² G03B 23/02

U.S. Cl. 352—72 **17 Claims**



1. In a motion picture sound camera for use with containers for motion picture sound film a portion of which is accessible or with relatively small containers for motion picture film without a sound track, a combination comprising a housing having a chamber for film containers and a cover which is movable between open and closed positions to respectively afford and prevent access to said chamber, a container for motion picture sound film being insertable into said chamber in a predetermined orientation so that said accessible portion of the film therein is located in a predetermined portion of said chamber, whereas a relatively small film container which is inserted in said chamber leaves said portion of said chamber unoccupied; a sound recording mechanism mounted in said housing and including a component movable between retracted and extended positions in which said component is respectively remote from and engages the accessible portion of sound film in a container in said chamber; locking means mounted in said housing and movable between operative and inoperative positions in which said locking means respectively prevents and permits opening of said cover; and control means including actuating means movable between first and second positions, a first power train normally operative to respectively move said component to said extended and retracted positions in response to movement of said actuating means to said first and second positions, and a second power train operative to respectively move said locking means to said operative and inoperative positions in response to movement of said actuating means to said first and second positions said actuating means comprising a handgrip member, a first control member which operates said first power train in response to manual movement of said handgrip member, and a second control member which operates said second power train in response to manual movement of said handgrip member, blocking means for blocking the operation of said first power train in a direction to move said component to said extended position when said portion of said chamber is unoccupied, said first power train comprising a carrier normally movable back and forth long a predetermined path in response to movement of said actuating means to said first and second positions and said blocking means comprising a device normally extending into said portion of said chamber and into said path to thereby prevent the movement of said carrier in a direction to return said component from said retracted to said extended position in response to movement of said actuating means from said second to said first position, said device being held out of said path by a container for sound film while such container occupies said portion of said chamber; and film transporting means

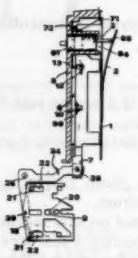
in said housing and a film frame counter movable to and from a starting position, one of said power trains comprising means for effecting the movement of said frame counter to said starting position in response to movement of said actuating means to said second position.

4,030,819

CINEMATIC EQUIPMENT SHUTTER SELECTOR MECHANISM

Roberto Bencini, c/o Dr.Ing. Misitano A.G. Via Padova, 217, 20127 Milan, Italy

Filed Feb. 4, 1974, Ser. No. 439,558
Int. Cl.² G03B 41/00
U.S. Cl. 352—79 3 Claims



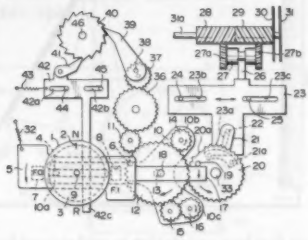
1. An aperture selector mechanism for dual film projectors having a drive spindle, comprising in combination: a projector frame, a first intermediate hub for the super 8 film spools to be co-operatively received into said drive spindle of the dual film projector, a second intermediate hub for the standard 8 film spools to be co-operatively received into the drive spindle of the dual film projector, the said first hub having a relatively small flange and the said second hub having a relatively large flange, an aperture plate having an aperture for the standard 8 film and an aperture for super 8 film, an aperture change-over lever manually displaceable from a first to a second position, and automatically displaceable from the said second to the said first position, articulation means connecting the change-over lever to the said aperture plate, the first position corresponding to the selection of the aperture for the super 8 film, the second position corresponding to the selection of the standard 8 film aperture, first resilient means acting on the change-over lever to resiliently bias said lever towards said first position, second resilient means resiliently biasing a first deplaceable means to project outside the projector frame, said first deplaceable means co-operable with the change-over lever to releasably lock the change-over lever in the said second position under the action of the said second resilient means, the said first resilient means causing the change-over lever to be automatically shifted from the said second to the said first position, the said second resilient means releasably locking the said change-over lever in said second position, the said first deplaceable means unlocking the change-over lever when it is pressed by the relatively small flange of the said first intermediate hub, a press finger formed in said change-over lever preventing the said second hub from being co-operatively received in the said drive spindle due to the physical interference with the relatively large flange of the said second hub, when the change-over lever is located in said first position.

4,030,820

AUTOMATIC FADING DEVICE FOR MOTION PICTURE CAMERA

Tetsuo Nishizawa, Kawagoe, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Dec. 5, 1975, Ser. No. 638,195
Claims priority, application Japan, Dec. 9, 1974, 49-147977[U]
Int. Cl.² G03B 21/36
U.S. Cl. 352—91 C 3 Claims



1. A fading device for a motion picture camera, comprising a pair of sectors rotated relatively to each other to vary the angle of a light passing section formed thereby for effecting the fade-in or fade-out, the sectors being rotated relatively to each other by means of a mechanism driven by a motor by way of a change-over means including a light passing angle varying member which is operable to change the direction of relative rotation of said sectors, a rotatable fade operating member operatively connected with said change-over means, an indicator board carrying a first index indicating that the fade-out is possible when the sectors are opened and a second index indicating that the fade-in is possible when the sectors are closed, a pair of windows which selectively make said indices appear therethrough, said indicator board and said windows being movable relatively to each other, and said fade operating member being associated with said windows, and means operatively connecting said indicator board with said light passing angle varying member to move said board to make the corresponding index appear indicating whether fade-out or fade-in is possible.

4,030,821

REAR SCREEN PROJECTOR WITH REMOTE PROJECTION CAPABILITY

Frank C. Badalich, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 9, 1976, Ser. No. 647,834
Int. Cl.² G03B 21/28, 21/30
U.S. Cl. 353—71 11 Claims

1. In a slide projection apparatus having a slide handling mechanism, the apparatus being convertible for projection of an image from a slide alternatively onto a remote surface and a built-in screen, the apparatus having projection means substantially enclosed within a housing, the projection means comprising:

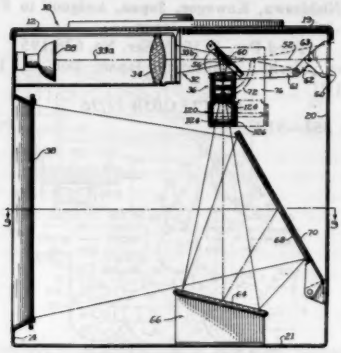
a focusable projection lens;

lens carrier means supporting said projection lens and being mounted for pivotable movement of said lens relative to said slide handling mechanism between a first orientation for projection of an image onto the remote surface, and a second orientation for projection of an image onto the built-in screen;

first lens focusing means accessible externally of said housing being coupled internally of said housing to said lens; and

second lens focusing means arranged fixedly within said housing for focusing of said lens for a predetermined

image to screen distance when said lens mounting means is moved relative to said focusing means upon movement



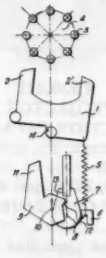
from said first lens orientation to said second lens orientation.

4,030,822

MECHANISM FOR CONTROLLING THE ADVANCE OF A MAGAZINE IN A TRANSPARENCY PROJECTOR

Serge Besancenot, 20, Avenue de Levry, 93270 Sevran, France

Filed Oct. 22, 1975, Ser. No. 624,829
Int. Cl.² G03B *23/00*
U.S. Cl. 353—103 **5 Claims**



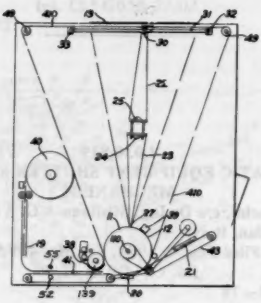
1. An arrangement for controlling the advance of a magazine in a transparency projector comprising a fork for advancing the magazine, a control member, a return spring acting on said fork and having one end constantly fixed to said control member, said control member being pivotally mounted about a fixed axis, an operating member having a cam-shaped portion cooperating with said control member, means for advancing the operating member towards the fork initially for pivoting the control member due to the action of the cam-shaped portion, said fork being pivoted by the return spring until an extreme position is reached, means on said cam-shaped portion for locking the fork against the magazine in said extreme position, and means for releasing said fork from engagement with the magazine upon withdrawal of said operating member, said fork being always urged in the same direction by said spring.

4,030,823

COPYING MACHINE

Richard D. Brugger, 4818 Walker Blvd., Erie, Pa. 16509, and Charles L. Lovercheck, 2319 S. Shore Drive, Erie, Pa. 16504

Filed Mar. 13, 1975, Ser. No. 557,973
Int. Cl.² G03G *15/30*
U.S. Cl. 355—8 **13 Claims**



1. A machine for copying documents comprising,
a document support,
a frame,
a cylindrical drum,
means supporting said drum on said frame to rotate about its longitudinal axis,
a photo conductor sheet supported on the outer periphery of said drum,
means holding said photo conductor sheet to the outer periphery of said drum,
a lens frame supported on said machine,
said lens frame supporting a first lens and a second lens,
means to move said lens frame through an arcuate path having its center of curvature on the outer periphery of said drum and at a speed proportional to the peripheral speed of said drum,
a means to support a supply of paper for receiving an image from said photo conductor sheet, and
conveyor means for carrying said paper from said supply into close relation with said drum and then to a dispensing means.

4,030,824

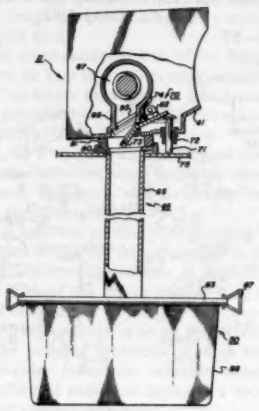
REPRODUCING APPARATUS HAVING AN IMPROVED IMAGING SURFACE CLEANING SYSTEM

Richard S. Smith, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 3, 1975, Ser. No. 628,183
Int. Cl.² G03G *21/00*
U.S. Cl. 355—15 **6 Claims**

1. A reproducing apparatus comprising:
an imaging surface;
a first frame;
means for removing residual material from said imaging surface, said removing means being supported by said first frame;
a second frame;
means remote from said removing means for storing said residual material removed from said imaging surface by said removing means, said storing means being supported in said second frame;
means for transporting said residual material from said removing means to said storing means including selectively connectable conduit means extending between said removing means and said storing means;
means for supporting one of said frames for movement relative to the other of said frames between a first posi-

tion wherein said conduit means is connected between said removing means and said storing means and a second position wherein said conduit means is disconnected between said removing means and said storing means; and



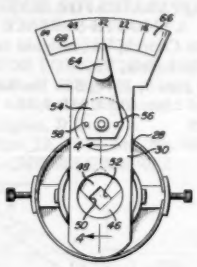
whereby upon movement of said one frame to said second position, said conduit portions are disconnected and upon movement of said one frame to said first position said conduit portions are connected together.

4,030,825

VARIABLE SIZE AND ANGULARLY ADJUSTABLE PROJECTION DIAPHRAGM

John N. Ghougasian, 666 W. 188 St., New York, N.Y. 10040

Filed Dec. 29, 1975, Ser. No. 644,899
Int. Cl.² G03B 27/76
U.S. Cl. 355—71 **10 Claims**



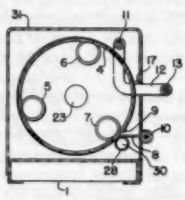
1. In combination with a camera including a forward lens assembly, means defining a film plane spaced rearward of said lens assembly and a halftone screen disposed immediately forward of said film plane, a projection diaphragm assembly including a support frame supported from said camera along the axis of said lens assembly for angular displacement about said axis, said diaphragm assembly including a pair of superposed plates disposed substantially normal to said axis and supported from said frame for inverse rectilinear oscillation along parallell paths extending generally diametrically of said axis, said plates having variably registrable openings formed therethrough of similar shapes and positioned relative to said axis whereby the aperture of said diaphragm assembly defined by registered portions of said openings is centered relative to said axis and the cross sectional shape of said aperture remains substantially constant throughout changes in the effective size of the aperture effected by inverse shifting of said plates relative to said frame.

4,030,826

EXPOSURE STATION FOR A CONTACT PRINTING DEVICE

Arlon G. Sangster, P.O. Box 414, Sterling, Mass. 01564

Filed May 27, 1975, Ser. No. 580,580
Int. Cl.² G03B 27/22
U.S. Cl. 355—104 **3 Claims**



1. Apparatus for making prints comprising a translucent cylinder, means supporting the same, a source of light located therein, means rotatably mounting said cylinder,

a flexible cover member attached longitudinally to the cylinder at one end of the cover member, the other end of the cover member being free and the cover member passing about the cylinder,

the free end of the cover member being adapted for manual pulling action, rotating the cylinder from an original position where the cover member is fully wound on said cylinder to a work loading station where said cover member is unwound and extended from said cylinder, spring biased return means to return the cover member and the cylinder to said original position upon release of said free end of said cover member,

a brake for the cylinder, means for normally applying the brake to stop rotation of the cylinder at any position thereof, and manual means to release the brake and to allow rotation of said cylinder,

said manual brake release means including a rod which is located above and adjacent the cover member in the work loading station of the cover member and which is operable by the operator as he loads the apparatus, said rod being substantially parallel to said cylinder and extending substantially across said cover member.

4,030,827

APPARATUS FOR THE NON-DESTRUCTIVE EXAMINATION OF HETEROGENEOUS SAMPLES

Michel Delhaye, Villeneuve D'Ascq; Yves J. M. Moschetto, Haubourdin, and Paul Dhamelincourt, Villeneuve D'Ascq, all of France, assignors to Institut National de la Sante et de la Recherche Medicale (Inserm), Paris, France

Filed Dec. 2, 1974, Ser. No. 528,804
Claims priority, application France, Dec. 3, 1973, 73.42945
Int. Cl.² G01J 3/44
U.S. Cl. 356—75 **6 Claims**

1. Apparatus utilizing the Raman effect for the production of micrographic images of the polyatomic components of a sample, comprising:

a. a selectively moveable support for the sample,

b. a source of monochromatic radiation,

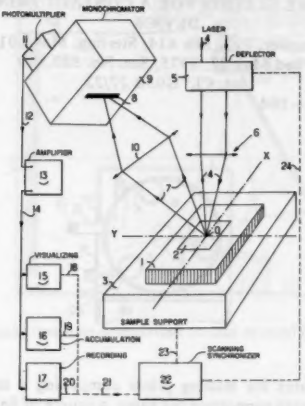
c. means permitting the non-destructive illumination of all or part of the sample by the monochromatic radiation,

d. optical means for converging Raman radiations scattered by the sample in the direction of a monochromator,

e. a monochromator for receiving the Raman radiations scattered by the sample, permitting the determination of the differences between the frequencies of the scattered

radiations and the frequency of the monochromatic radiation, and selecting and transmitting one of the Raman radiations,

f. photoelectric means for detecting the Raman radiation transmitted by the monochromator and



g. means for the production of micrographic images of the shape, position and distribution of the polyatomic components of the sample utilizing information furnished by the photoelectric detection means.

4,030,828

SPECTROPHOTOMETER

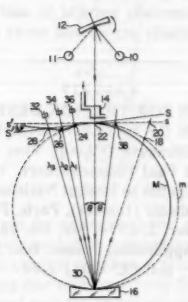
Shigeru Sonobe; Makoto Watanabe, both of Katsuta; Iwao Kato, Mito, and Tomoyoshi Sato, Sapporo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 23, 1976, Ser. No. 669,705

Claims priority, application Japan, Mar. 26, 1975, 50-35472

Int. Cl.² G01J 3/42

U.S. Cl. 356—96 **5 Claims**



1. In a spectrophotometer, comprising a light source, a concave for receiving perpendicularly to the grating face thereof a light beam from said light source through an inlet slit, and a detector for detecting a diffracted beam from said concave grating through an exit slit; the improvement wherein said concave grating is composed of a stigmatic concave grating and that at least an exit slit is provided substantially in a plane region encompassed by a meridional image line and a sagittal image line of the diffracted light ray from said stigmatic concave grating.

4,030,829

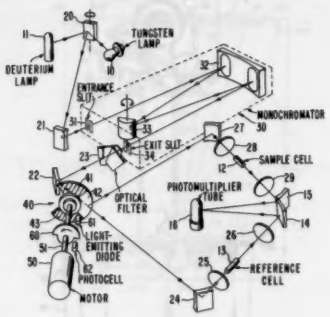
KEYING WAVEFORM GENERATOR FOR SPECTROPHOTOMETER

Gerald E. Hooper, Los Altos Hills, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Apr. 12, 1976, Ser. No. 676,075

Int. Cl.² G01J 3/42

U.S. Cl. 356—97 **16 Claims**



11. A double beam spectrophotometer comprising a rotatable optical chopper for directing a radiation beam alternately through separate channels to a photodetector, means for generating a bipolar square wave signal indicative of the rotational position of said optical chopper, means for integrating said square wave signal to provide a substantially triangular waveform, and means for monitoring particular cyclically recurring points on said triangular waveform to generate a plurality of pulse trains, each pulse train corresponding to a particular event occurring in the operation of said spectrophotometer, the pulses of said pulse trains being electrical timing signals for synchronizing particular events in the operation of said spectrophotometer with the rotational motion of said optical chopper.

4,030,830

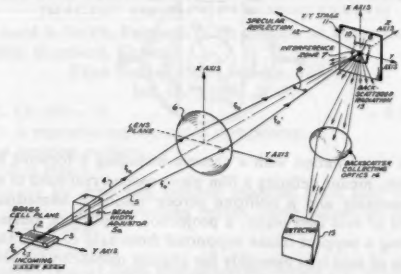
PROCESS AND APPARATUS FOR SENSING DEFECTS ON A SMOOTH SURFACE

Sandor Holly, Falls Church, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Jan. 5, 1976, Ser. No. 647,264

Int. Cl.² G01B 9/02

U.S. Cl. 356—109 **68 Claims**



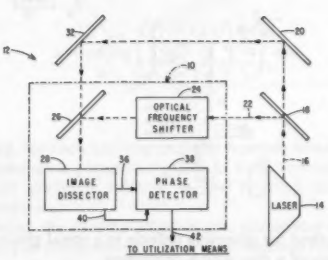
29. A process for sensing the effective magnitude and/or number and/or spatial distribution of individual depression and/or protrusion defects on a high-precision smooth surface of an article which may have said defects randomly distributed and relatively spatially-distant each from the other and which additionally may have relatively spatially-distant rough spots comprising adjacent randomly-distributed defects, comprising:

a. producing two coherent optical radiation beams of the same intensity, one of said beams having a different frequency from said other beam, the frequency difference Δf being within the radio frequency range;
b. converging said beams to form an interference zone comprising a fringe pattern within the zone of convergence, said fringe pattern continuously moving laterally at a rate equal to Δf;
c. adjusting the cross-sectional area of the fringe pattern in the x–y plane so that it is substantially smaller than said surface and no larger than an area which includes about an average predetermined spatial incidence of about one defect per pattern area on said surface;
d. adjusting λ_x to a width which is at least about 2 times wider than the effective cross-sectional dimension of a predetermined, maximum-size defect as indicated by backscatter signal magnitude;
e. positioning at least the portion of said article bearing said smooth surface within the fringe pattern in such manner that said surface lies substantially in a plane defined by the x and y axes of the fringe pattern and the angle of incidence of the bisector of the pair of converging beams forming the fringe pattern is at an angle relative to said surface at the point of incidence such as to provide an angle of specular reflection, wherein substantially all specularly-reflected radiation bypasses a receiver of the backscattered optical radiation;
f. continuously spatially displacing the interference zone and/or said smooth surface relative to each other while maintaining the relative orientation of said surface and said fringe pattern substantially as defined in (e) surpa;
g. continuing said relative displacement in such manner that substantially the entire predetermined area of said surface or sufficient area to determine the presence of unacceptable defects is scanned by said fringe pattern; and
h. as said relative displacement continues, continuously sensing the AC signal component of the backscattered radiation, wherein, at any given instantaneous moment of scan, in the case comprising sensing of a single defect within the cross-sectional area of the fringe pattern:
1. a substantially zero AC signal indicates smooth, defect-free surface; and
2. a substantially non-zero AC signal indicates the presence of a defect, the effective width of which is substantially proportional to the AC signal amplitude.

4,030,831
PHASE DETECTOR FOR OPTICAL FIGURE SENSING

Sankaran Gowrinathan, Westport, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 22, 1976, Ser. No. 669,412
Int. Cl.² G02B 9/02
U.S. Cl. 356—109 **2 Claims**

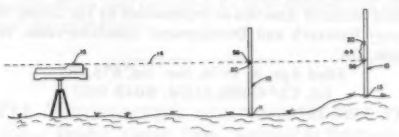


1. Interferometric apparatus for generating an analog voltage output signal corresponding to the optical quality of a test surface, said apparatus comprising:
light source means for providing a test surface illuminating interrogation beam and a reference beam capable of producing interference patterns as a function of the optical phase difference between wavefronts in said beams;
frequency shifter means, mounted in the path of one of said beams, for introducing a predetermined frequency shift in said one of said beams;
image dissector means, mounted so as to be responsive to interference between said reference beam and said interrogation beam, for providing a frequency modulated electrical signal characterized by a carrier frequency equal to said predetermined frequency shift and frequency modulated in accordance with said optical phase difference, said image dissector means comprising signal generator means, for generating electrical sweep signals that vary as a predetermined function of time and a scanning photo-electric detector means, responsive to said sweep signals, for effecting predetermined scans of said interference patterns; and
phase detector means, responsive to said frequency modulated electrical signal, for providing an analog output signal which varies with changes in said optical phase difference, said phase detector means comprising phase lock loop means, responsive to said frequency modulated electrical signal, for demodulation thereof to provide an intermediate analog signal corresponding to rate of change of said phase difference, and integrator means, connected to said phase lock loop means, for integration of said intermediate analog signal with respect to time so as to provide said analog output signal.

4,030,832
AUTOMATIC GRADE ROD AND METHOD OF OPERATION

Joseph F. Rando, Cupertino; Arthur Sobel, Los Altos Hills, and Richard W. Davidson, Santa Clara, all of Calif., assignors to Spectra-Physics, Inc., Mountain View, Calif.

Filed Feb. 10, 1975, Ser. No. 548,607
Int. Cl.² G01B 11/26; G01C 3/08, 15/06
U.S. Cl. 356—152 **21 Claims**



18. A method of establishing a location or physical object at a pre-determined distance perpendicular from the plane of a modulated laser beam by means of an elongate scale which is mounted for movement with a modulated laser beam detector including the steps of moving said beam detector and scale conjointly along a path which intersects said beam plane transversely, detecting the intersection of the laser beam on the detector, aligning said beam detector on the beam plane of the beam, and establishing said location or physical object with respect to the portion of said scale which is at said predetermined distance from said beam detector.

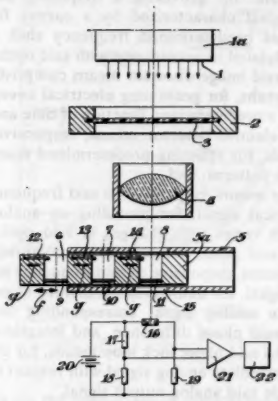
4,030,833
COLOR FILTER DETERMINING APPARATUS

Siegfried Barbieri, Brixen, Italy, assignor to Durst AG Fabrik Fototechnischer Apparate Bozer, Gerbergasse, Italy

Filed Mar. 6, 1975, Ser. No. 555,933
Claims priority, application Italy, Mar. 13, 1974, 4835/74
Int. Cl.² G01J 3/50
U.S. Cl. 356—175 **14 Claims**

1. A color filter determining apparatus for determining the required insertion of color filters in the path of colored light projected from a color head incorporating the color filters comprising a housing, color windows in the housing relating to

the color components in the projected light, light filters in each of the windows to cause differently colored light components to pass through them, adjustable optical diaphragms in each of the color windows for adjusting the amount of each of the color light components projected through each of the color windows whereby a predetermined balanced color combination is caused to pass through the color windows when the



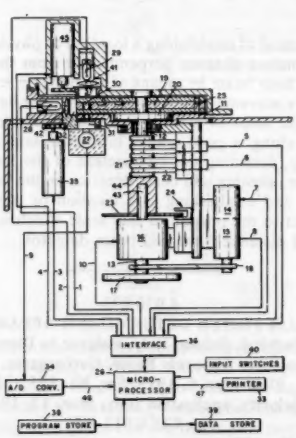
color filters are inserted in the projected light to provide the predetermined measured color balance, and a light intensity measuring means is mounted on the housing in optical line with at least one of the color windows for determining when the predetermined balance of light components is passing through the color windows from the color head and its color filters inserted in the path of light projected from it.

4,030,834

DYNAMIC MULTISTATION PHOTOMETER

Martin L. Bauer, Oak Ridge; Wayne F. Johnson, Loudon, and Dale G. Lakomy, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 8, 1976, Ser. No. 675,085
Int. Cl.² G01N *21/24*; B04B *9/02*
U.S. Cl. 356—197 **4 Claims**



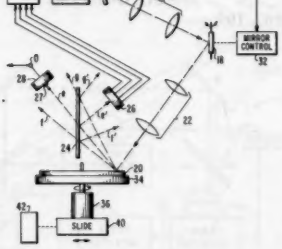
1. In a minature fast photometer analyzer including a rotor holder, a driving shaft coupled to said holder, a removable rotor provided with a plurality of cuvetes positioned close to the outer edge of said rotor and adapted to receive respective samples and reagents thereinto upon acceleration of said rotor, said rotor adapted to be fixedly positioned onto said rotor holder, a photomultiplier, a filter, and a light source, the cuvetes of said rotor adapted to be sequentially passed between said light source and filter and said photomultiplier upon rotation of said rotor holder and rotor by said driving shaft, a printer, means for transmitting and processing the output signals of said photomultiplier and conveying them to said printer, said output signals being a function of the transmission/absorbence signals received throught respective ones of said rotor cuvetes containing said respective samples and reagents therein, a thermistor mounted in said rotor for monitoring the temperature thereof, a first pair of slip rings coupled to said drive shaft and electrically coupled to said thermistor, a first pair of brushes associated with and contacting said first pair of slip rings for conveying an output signal from said thermistor, and means for energizing said lamp and providing a high voltage to said photomultiplier, the improvement comprising a clutch/brake unit provided with an idler shaft and being coupled to said rotor holder drive shaft, said idler shaft having a flywheel affixed thereto, a drive motor provided with an output shaft, drive belt coupled to said motor output shaft and to said idler shaft, means for energizing said drive motor and means for selectively energizing the brake or clutch of said clutch/brake unit, whereby said brake is adapted to be energized with said clutch deenergized until a desired speed is reached by said drive motor and then said brake is adapted to be deenergized while said clutch is then energized and said rotor holder and affixed rotor are then brought up to a desired running speed in a rapid manner to effect the rapid mixing of said respective samples and reagents within said respective cuvetes thus minimizing the presence of any bubbles and froth therein such that the rapid acquisition of said output signals can be effected.

4,030,835

DEFECT DETECTION SYSTEM

Arthur Herbert Firester, Skillman, and Istvan Gorog, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 28, 1976, Ser. No. 691,206
Int. Cl.² G01N *21/32*
U.S. Cl. 356—111 **8 Claims**



7. A method for detecting defects in a spiral groove formed in a surface of a disc which comprises:

rotating said disc;

forming a beam of light, directed toward the grooved surface of said rotating disc and converging toward a point beyond said surface to illuminate a region of said rotating disc spanning a plurality of convolutions of said spiral groove, while establishing relative translation between

said grooved surface of said rotating disc and said beam in such a manner that a succession of regions of said grooved surface are scanned by said light beam in a coarse spiral pattern having a pitch appreciably greater than the pitch of said spiral groove;

intercepting the zero diffraction order component of light diffracted by defect-free regions of said grooved surface when illuminated; and

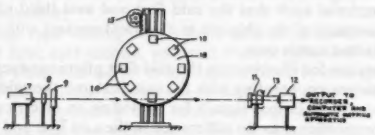
detecting the presence of light in a region surrounding the location of said zero diffraction order component interception.

4,030,836

METHOD FOR MAPPING SURFACES WITH RESPECT TO ELLIPSOMETRIC PARAMETERS

Tennyson Smith, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 28, 1975, Ser. No. 626,148
Int. Cl.² G01N *21/40*
U.S. Cl. 356—118 **1 Claim**



1. The method of mapping and utilizing for nondestructive testing purposes certain ellipsometric parameters of a discrete surface area of a structural member comprising the steps of

scanning said discrete surface area from an oblique angle with a polarized monochromatic light beam,

analyzing the light beam reflected from said surface area with a rotating analyzer,

detecting with detector means the outputs of the rotating analyzer,

recording the output values of the detector means for rotating analyzer azimuth orientation of 0°, 45° and 90° at a multiplicity of positions along each sweep of light beam scan, deriving ellipsometric parameters from said recorded output values by means of equations

$$\psi = (\tfrac{1}{2} \arccos\left(1 - \frac{2 I_0}{I_{90} + I_0}\right)$$

$$\Delta = \arccos\left\{\left(\left(\frac{2 I_{45}}{I_0 + I_{90}}\right)^{-1}\right\} \text{ and}$$

$$\sin 2\psi$$

$$R = I_r/I_i,$$

plotting, for each rotating analyzer azimuth orientation, the ellipsometric parameter values at their appropriate coordinate positions relative to the scanned surface area boundaries,

converting the derived ellipsometric parameter values into values of ellipsometric physical parameters for refractive index, absorption coefficient and material thickness,

plotting said ellipsometric physical parameter values at their appropriate coordinate positions relative to the scanned surface area boundaries, and

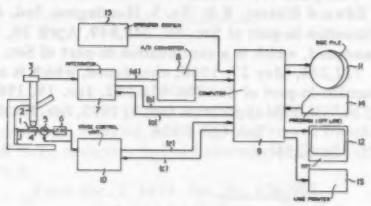
correlating said plotted ellipsometric parameter values and said plotted ellipsometric physical parameter values with an S-map of said discrete surface area.

4,030,837

METHOD AND APPARATUS FOR AUTOMATICALLY MEASURING DISTRIBUTION OF REFLECTANCE OF COALS

Kojiro Kojima, Kunitachi; Yoshihisa Sakurai, Yokohama; Tetuya Sugai, Tokyo, and Masayoshi Motegi, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sept. 29, 1975, Ser. No. 617,490
Int. Cl.² G01N *21/22*
U.S. Cl. 356—209 **6 Claims**



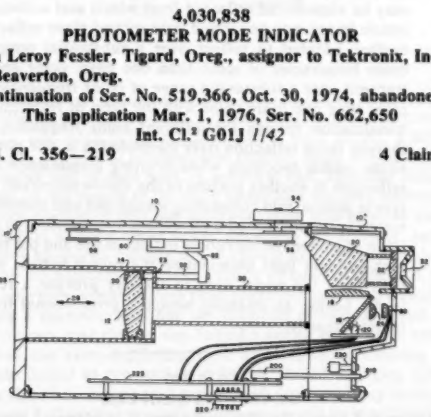
1. A method for measuring the reflectance of the coals wich comprises providing a movable sample stage below a microscope, said stage moving stepwise by a predetermined distance at each predetermined time, placing a sample on said sample stage, projecting light onto said sample, conducting light reflected by said sample to a photodetector via said microscope for converting said reflected light to an electrical output, integrating said output, repeating the above measuring operation at each such movement of said stage so as to measure the reflectance at a large plurality of points, introducing into a calculation unit outputs accumulated in said integrating unit by the instruction of a control unit controlling the movement of said stage, said calculation unit and a record indication unit, said calculation unit conducting an operation for measuring the distribution of the reflectance, and displaying the results of such calculation unit operation so as to indicate the distribution of the reflectance.

4,030,838

PHOTOMETER MODE INDICATOR

Jon Leroy Fessler, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 519,366, Oct. 30, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,650
Int. Cl.² G01J *1/42*
U.S. Cl. 356—219 **4 Claims**



1. An apparatus for facilitating the measurement of light intensity when using a digital photometer or similar device having readout incorporating memory, comprising:

first means for providing a visually observable optical image of a scene;

second means for sensing the light intensities within a small acceptance angle of a selected portion of said scene

operatively associated with said first means and for providing a visually observable indication of said selected portion; and

third means operatively associated with both said first and said second means for simultaneously providing said sensed light intensities as an output signal for use by the digital photometer readout and for modifying the visually observable indication of said selected portion for indicating a memory mode of the digital photometer.

4,030,839

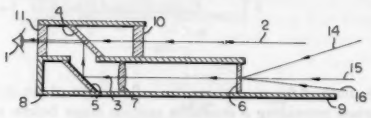
FREQUENCY SELECTIVE REFLEX SIGHT

Glenn Edward Rickert, R.R. No. 9, Huntington, Ind. 46750

Continuation-in-part of Ser. No. 245,849, April 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 732,234, May 27, 1968, abandoned, which is a continuation-in-part of Ser. No. 610,302, Jan. 19, 1967, Pat. No. 3,524,710. This application Oct. 1, 1973, Ser. No. 402,376

Int. Cl.² G02B *27/34*

U.S. Cl. 356—251 **9 Claims**



1. A reflex sight for superimposing a view of a target and an image of reticle indicia comprising in combination:

light conducting reticle indicia comprising a light transmitting portion on an otherwise opaque background;

refractive collimating means having a positive focal length and displaced from the reticle indicia a distance approximately equal to its focal length to collimate an image of said reticle indicia;

first and second plane reflecting surfaces arranged in periscopic relation with the first surface being substantially fully reflective, said first and second surfaces in conjunction with said collimating means adapted to provide a displaced collimated image of said reticle indicia;

the second plane reflecting surface comprising frequency selective beam combining means through which a target may be viewed and reflected from which said collimated reticle image may be viewed, said second plane reflecting surface adapted to reflect over a substantial range of color frequencies of more than one basic color and to transmit over a substantial range of color frequencies of more than one basic color with the ratio of reflection to transmission varying for different color frequencies to thereby favor reflection over transmission in one portion of the visible spectrum while favoring transmission over reflection in another portion of the visible spectrum, said reticle indicia, said collimating means and said combining means being positioned with respect to each other so as to allow alignment of the reticle indicia image and the target with ambient light illuminating the reticle indicia being light from the target area to thereby provide a reticle image having an intensity which is proportional to the target intensity.

4,030,840

WAVEFORM SAMPLER

Robert A. Lawton, Boulder, and James R. Andrews, Lafayette, both of Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 25, 1976, Ser. No. 670,468

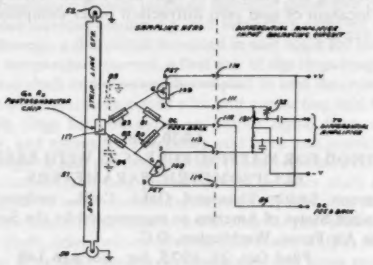
Int. Cl.² G01R *13/34*

U.S. Cl. 356—256 **6 Claims**

1. A waveform sampler comprising:

a. an electrical transmission line having a center conductor and an electrical signal input connection and an electrical signal output connection;

b. a chip of photoconductive material having a first and a second electrical contact forming a first photoconductor therebetween and providing a first electrical signal output and a third and fourth electrical contact forming a second photoconductor therebetween, and providing a second electrical signal output;



c. means for positioning the said chip of photoconductive material such that the said first and said third electrical contacts of the chip are in electrical contact with the said center conductor;

d. means for illuminating the said first photoconductor; and

e. means cooperating with the said first and the said second electrical output signals for providing an electrical signal proportional to the difference in the said first and the said second electrical signals.

4,030,841

TRIANGULAR HOLDER AND INSTRUMENT

Darrell S. Balasty, 2624 N. McVicker, Chicago, Ill. 60639

Filed July 24, 1975, Ser. No. 598,665

Int. Cl.² B43K *23/00*

U.S. Cl. 401—6 **5 Claims**

1. A writing instrument holder comprising a substantially elongated walled hollow housing having a triangular outer wall shape open at least one end and adapted to frictionally engage a writing instrument therein, one wall of said housing being discontinuous, a slotted aperture communicating between said one wall and the hollow portion of said housing, a pair of recesses in spaced apart relation on said one wall, each recess being on an opposite side of said slotted aperture, a channel communicating between one of said recesses and an opposing wall of said housing, and connecting means adapted to engage said recesses.

4,030,842

COMBINATION WRITING INSTRUMENT AND INFORMATION STORAGE APPARATUS

John White, and David Abbots, both of Alexander Drive, Brookfield, Conn. 06804

Filed Aug. 3, 1976, Ser. No. 711,120

Int. Cl.² B43K *29/00*

U.S. Cl. 401—195 **10 Claims**

1. A combination writing instrument and information storage apparatus comprising:

an elongated barrel having first and second free ends and a first longitudinal open-ended chamber therein, a longitu-

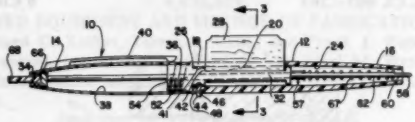
dinal slot being located in an outer surface of said barrel and extending into said first chamber;

an elongated cap element having a second longitudinal chamber therein, said cap element having a first free end and a second end;

an elongated tubular spindle dimensioned to be partially inserted through said second free end of said barrel and within said first longitudinal chamber, said spindle having a third longitudinal open-ended chamber therein, said spindle having a first free end and a second free end;

means for securing said first free end of said elongated tubular spindle to said second free end of said elongated cap element, said second and said third longitudinal chambers being partially coextensive;

rotatable securing means for rotatably securing said elongated tubular spindle partially within said barrel, said first



and said second longitudinal chambers being partially coextensive;

cartridge-type writing means dimensioned to reside within said first, said second, and said third longitudinal chambers when said barrel is rotatably affixed to said spindle and said spindle is fixedly secured to said cap element;

means for extending and retracting said writing means through said first free end of said barrel; and

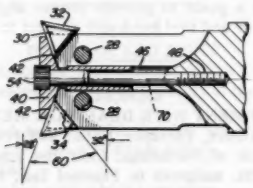
a flexible sheet fixedly secured on one end thereof to the outer surface of said spindle and extending outwardly through said longitudinal slot, the rotation of said spindle in one direction about the longitudinal axis thereof retracting said flexible sheet within said first longitudinal chamber of said barrel, the rotation of said spindle in the other direction about the longitudinal axis thereof extending said flexible sheet out of said slot.

4,030,843

TRIPLE CORNER BORING BAR

Fredrick Eugene Harp, 733 W. Granite St., Siloam Springs, Ark. 72761

Filed Jan. 12, 1976, Ser. No. 648,747
Int. Cl.[2] B23B 27/16, 29/02
U.S. Cl. 408—197 **3 Claims**



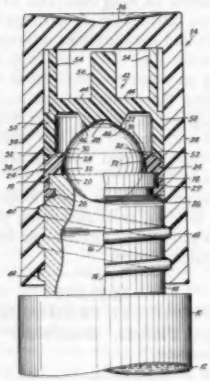
1. A boring bar tool for triangular cutting inserts comprising: a body member having a centerline; a single slot diametrically across the distal end of the body member, said slot forming only two bendable segments of said body member; only two triangular cutting inserts; a recess portion in each segment formed by a side surface and an angular surface, said angular surface being disposed at an angle of about 32° from a plane perpendicular to said centerline and at an angle of about 11 degrees from an axis perpendicular to said centerline, each recess supporting a single triangular cutting insert; a central aperture along said centerline formed by opposing further recesses in said segments and aligned with a threaded portion in said body member; an adjusting plug means having a tapered conical end portion, a cylindrical hub portion and a bolt receiving aperture extending through the center of said portions, said tapered conical end portion being disposed at an angle of about 28° from said plane when said hub portion is received in said central aperture; an adjusting bolt means cooperating with said threaded portion to adjustably secure the plug means to said body member; and two clamping means cooperating with said segments to draw the bendable segments together to firmly lock each cutting insert as adjusted between said side surface and a portion of the opposed segement.

4,030,844

ROLL-ON DISPENSER BOTTLE ASSEMBLY

Jack Lench, West Babylon, and Luigi M. Ferrari, Douglaston, both of N.Y., assignors to Del Laboratories, Inc., Farmingdale, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,915
Int. Cl.[2] B43K 7/00
U.S. Cl. 401—213 **5 Claims**

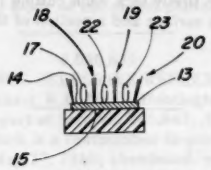


1. A dispenser bottle assembly with closure cap comprising a bottle, said bottle having a cylindrical neck with a circular mouth, said neck being provided with a male thread, a substantially cylindrical retainer, said retainer being mounted on the outlet end of said neck, a spherical ball, said ball being seated on the mouth of the neck under said retainer whereby a minor portion of said ball protrudes from said retainer and the ball is trapped between the neck and the retainer, said retainer having an extension terminating at an inner circular flexible lip adjacent the upper surface of said ball, the end of said lip which is spaced away from said mouth defining a circle having a diameter less than the diameter of said ball, and a closure cap, said closure cap having a crown and a skirt, said closure cap skirt depending from said crown and having a female thread at one end, said female thread engaging said male thread to mount said cap on said neck, said cap having an inner ball-seating central protuberance and an inner annular camming surface adjacent to said crown, said protuberance being in contact with the surface of said ball, whereby said protuberance presses said ball towards said bottle and thereby seats said ball in the mouth of said bottle, said camming surface depending from said crown and terminating in contact with said lip, whereby said circular lip is pressed against said ball to provide essentially hermetic closure sealing of said bottle.

4,030,845
TOOTHBRUSH WITH SELF-CONTAINED DENTIFRICE AND DISPOSABLE HANDLE

Dennis D. Deckert, 8550 E. 196th St., Noblesville, Ind. 46060

Filed May 17, 1976, Ser. No. 687,347
Int. Cl.² A46B 11/00
U.S. Cl. 401—268 7 Claims



1. A teeth-cleaning device comprising:

a base having an elongated configuration and further having a top surface and a bottom surface;

a plurality of upstanding and straight bristles fixedly mounted to said base and extending outwardly from said top surface being flexible and resilient and arranged in a plurality of spaced apart and parallel rows;

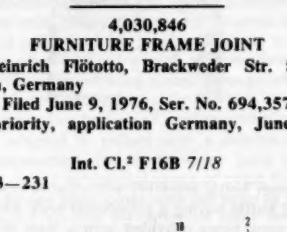
a plurality of flexible and resilient loop-configured bristles fixedly mounted to said base and extending outwardly from said top surface being arranged in a plurality of spaced apart and parallel lines interspaced between and separating apart said rows, said loop-configured bristles each having an outer rounded distal end with a pair of legs extending therefrom toward and attached to said base, said legs being spaced apart defining a dentifrice-holding area with one of said legs being severed between said distal end and said base allowing release of said dentifrice; and,

dentifrice means positioned on said loop-configured bristles within said holding area and being operable to release onto teeth when rubbed against said teeth in the presence of a liquid release agent.

4,030,846
FURNITURE FRAME JOINT

Reinhard-Heinrich Flötotto, Brackweder Str. 52, D 4830 Gutersloh, Germany

Filed June 9, 1976, Ser. No. 694,357
Claims priority, application Germany, June 10, 1975, 2525791
Int. Cl.² F16B 7/18
U.S. Cl. 403—231 11 Claims

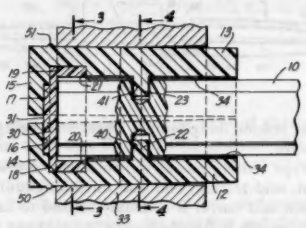


1. In a knock-down sectional furniture frame incorporating first and second frame members and a coupling for fixing said frame members together with he end of said first member abutting the side of the said second member the improved coupling which comprises a first transverse bore into said first member, a longitudinal bore extending from said end of said first member and intersecting said first transverse bore, a second transverse bore in said second member in alignment in said longitudinal bore in said first member, a third transverse bore in said second member from said second transverse bore, a metal fitting adapted to fit in the angle between said members, a connector element rigidly fixed to said metal fitting and adapted to be inserted into said first transverse bore, a connector piece insertable through said second transverse bore and said longitudinal bore and engageable with said connector element, and a fixing element in said third transverse bore and engageable with said metal fitting.

4,030,847
ADAPTER FOR FIBERGLASS TOOL HANDLES AND OTHER FIBERGLASS CONNECTIONS

Joseph Allen Carmien, Sun Valley, Calif., assignor to Nupla Corporation, Sun Valley, Calif.

Filed June 10, 1976, Ser. No. 694,844
Int. Cl.² F16B 21/00
U.S. Cl. 403—263 8 Claims



1. An adapter for connecting a tool head to a fiberglass tool handle and for making other attachments to fiberglass members in which the tool head or other member has an opening in which the end of the handle or the like is inserted, said adapter comprising a closed cap dimensioned to fit closely over the end of said handle, a pair of adapter sections having a combined exterior formed substantially complementarily to the interior of said tool head opening, said adapter sections being mounted in overlying relationship to said cap and in engagement with the adjacent exterior of said handle so that said handle portion and cap are substantially completely enclosed by said adapter sections, each of said adapter sections having a recess formed complementarily to and adapted to fit around one end of said cap, the depth of said recess being substantially equal to the wall thickness of said cap, said cap having greater compressive strength than said handle to prevent damage to the end of said handle by excessive compressive force directed against it during assembly or use, said cap also acting as a guide to provide proper alignment of said adapter sections and tool head with respect to said handle.

4,030,848
LINED EQUIPMENT WITH DUAL BASE METAL INSERTS

Hibbard G. Keifert, Torrance, Calif., and Frank J. Waters, deceased, late of Northridge, Calif., by Ethel M. Waters, administratrix, assignors to Fansteel Inc., North Chicago, Ill.

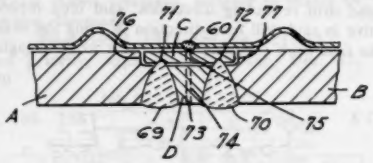
Filed Oct. 18, 1976, Ser. No. 733,246
Int. Cl.² F16B 5/08
U.S. Cl. 403—272 10 Claims

1. A wall assembly joint formed between abutting ends of layered elements each comprising a layer of first metallic material and a layer of second metallic material in face-to-face relation,

a. an intermediate filler base member interposed between the ends of said layer of first metallic material and fusion welded to each of said ends,

b. an inlaid insert of said first metallic material underlying the abutting ends of the other of said layered elements and bridging said fusion welds between the filler base member and the ends of said layer of first metallic mate-

rial, said inlaid insert being welded to said ends by said fusion welds, and



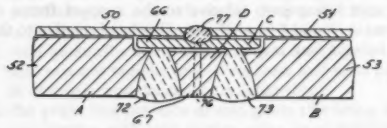
c. a fusion weld joining the abutting ends of said second metallic material.

4,030,849

LINED EQUIPMENT AND METHOD OF FABRICATION

Hibbard G. Keifert, Torrance, Calif., and Frank J. Waters, deceased, late of Northridge, Calif., by Ethel M. Waters, administratrix, assignors to Fansteel Inc., North Chicago, Ill.

Filed Oct. 18, 1976, Ser. No. 733,244
Int. Cl.² F16B 5/08
U.S. Cl. 403—272 **11 Claims**



1. A wall assembly joint formed between abutting ends of layered elements each comprising a layer of first metallic material and a layer of second metallic material to face-to-face relation,

a. an intermediate filler member of first material interposed between the ends of the layered elements of first material and fusion welded to each of said ends,

b. an inlaid insert of second material underlying the abutting ends of the layered elements of second material, and bridging said fusion welds between the filler base member and the layered elements of first material, and

c. a fusion weld joining the abutting ends of the layered elements of second material and the inlaid insert of second material to provide a relatively smooth surface in the second layer.

4,030,850

INTERLOCKED JOINT

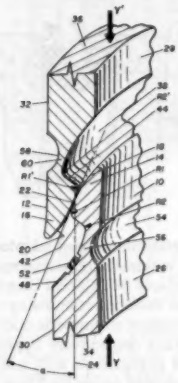
George S. Hyde, Sparta, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 2, 1976, Ser. No. 710,941
Int. Cl.² F16D 1/00
U.S. Cl. 403—288 **5 Claims**

1. An interlocked joint which comprises:

a hollow male section having an annularly triangularly shaped male flange located on a peripheral edge of said hollow male section, said male flange having a convex male flank surface disposed on an exterior wall of said male section, a male shouder section positioned adjacent to said male flank surface, an annular male flank groove located adjacent to said male shoulder section, said male flank groove having an annular gasket groove operatively disposed therein, and a first annular deflecting groove disposed in an interior wall of said male section, said male flank groove and said first annular deflecting groove being oppositely positioned on said hollow male section to provide a male necked down flange section;

a hollow female section having an annularly triangularly shaped female flange located on a peripheral edge of said hollow female section, said female flange having a convex female flank surface disposed on an interior wall of said female section, a female shoulder section positioned adjacent to said female flank surface, an annular female flank groove located adjacent to said female shoulder section, a second annular deflecting groove disposed in an exterior wall of said female section, said female flank groove and said second annular deflecting groove being oppositely on said hollow female section to provide a female necked down flange section; and



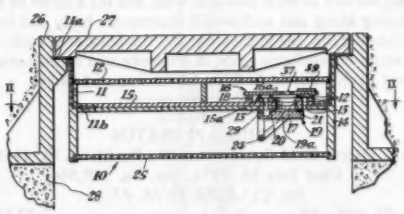
gasket means proximately disposed in said annular gasket groove for providing an hermetic seal between said male section and said female section when said hollow male and female sections are axially aligned with each other and forcibly pushed into interlocking engagement with each other, said male and female flanges being deflected away from each other when said male and female flank surfaces slide over each other, said male flange entering into said female flank annular groove and said female flange entering into said male flank annular groove to permit said male and female shoulder sections to make contact with each other and to resist movement of said male and female sections away from each other.

4,030,851

MANHOLE CLOSURE INCLUDING A TWO-WAY PRESSURE RELIEF VALVE

Walter C. Graybeal, 2100 N. 61st Ave., Hollywood, Fla. 33024

Filed Nov. 3, 1976, Ser. No. 738,522
Int. Cl.² E02D 29/14
U.S. Cl. 404—25 **9 Claims**



1. A gaseous pressure compensating manhole closure for diverting runoff water away from a sewer system adapted to be mounted in a conventional manhole opening frame with the conventional manhole cover mounted therein, the device comprising:

a cylindrical housing;

a rigid plate disposed in said housing forming a receiving upper chamber;

a pressure relief valve means coupled to said plate to allow fluid communication through said plate;

an annular supporting rim attached to said housing sized to be received mounted about the manhole opening frame perimeter.

4,030,852

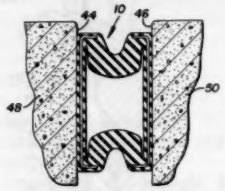
COMPRESSION SEAL FOR VARIABLY SPACED JOINTS

Richard D. Hein, Wabash, Ind., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed July 15, 1975, Ser. No. 596,127

Int. Cl.² E01C *11/10*

U.S. Cl. 404—66 **9 Claims**



1. A reinforced elastomeric seal adapted for installation in lateral compression within a longitudinal space defined between the face to face surfaces of adjacent members to effect a seal between the member surfaces, comprising in combination: (a) a hollow elongated resilient elastomeric body having two generally vertical side walls respectively opposed external sealing surfaces adapted for engagement with said member surfaces, a horizontally compressible upper buckling wall merging along its edges into the respective upper edges of said side walls, and a horizontally compressible lower buckling wall merging along its edges into the respective lower edges of said side walls, said buckling walls having relatively thick central portions that buckle under compression and exert resisting forces that force said sealing surfaces of said side walls into sealing engagement with said member surfaces and said buckling walls also having relatively thin sloping edge portions adjacent said upper edges of said side walls that allow inward flexing of said buckling walls toward said side walls during said compression of the buckling walls; (b) a respective series of vertical spaced apart metal reinforcing ribs disposed within each said side wall and along the length of each said side wall with the top and the bottom of each rib of said ribs being respectively formed to extend generally horizontally within and into both a portion of said upper support wall and a portion of said lower support wall and with the alternate adjacent top ends and the alternate bottom ends of each rib of said series of said ribs being joined together in a reverse curve configuration and forming a metal member of continuous length for each series of reinforcing ribs, said ribs as formed being adapted to distribute the said resisting forces exerted by said upper and lower compressible buckling walls across the sealing surface of each said side wall; and (c) a series of fibers extending along and within said elastomeric body and linking together the top, the midsection and the bottom of each rib of said series of reinforcing ribs to reinforce said elastomeric seal against stretch during both its fabrication and its use.

4,030,853

DRILL APPARATUS

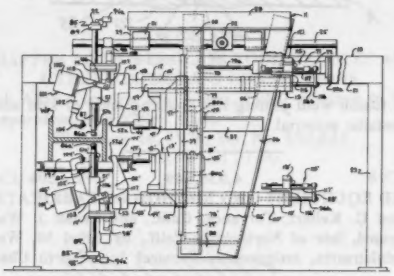
Neil J. Mizen, 1603 Greenmount St., Rockford, Ill. 61107

Filed July 30, 1976, Ser. No. 709,960

Int. Cl.² B23B *39/18, 47/18*

U.S. Cl. 408—10 **21 Claims**

1. An apparatus for drilling holes in a workpiece comprising: a stationary support frame, work locating means for locating a workpiece relative to the stationary support frame, a drill carriage mounted on the stationary support frame for movement relative thereto along a linear path, a drill head mounted on the carriage and having drill means rotatable about an axis paralleling said linear path, a work engaging head mounted on said drill head for movement relative thereto along a feed path paralleling said linear path, said work engaging head having a first work engaging face opposing the drill means, feed means connected to said drill head and to said work engaging head for selectively moving the latter along said feed path in drill feed and drill retracting directions, said feed means being operative in said drill feed direction to bring the drill means and the first work engaging face on the work engaging head



into engagement with respective front and rear facing surfaces on the workpiece and to thereafter advance the drill means into the workpiece, said drill carriage being freely movable along said linear path relative to the support frame during movement of said first work engaging head relative to the drill head by said feed means.

4,030,854

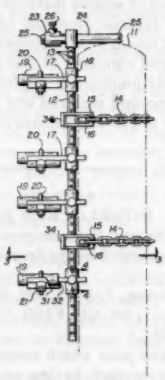
UTILITY POLE DRILL GUIDE

Roland K. Grannis, San Mateo, Calif., assignor to Pacific Utilities Supply Co., San Francisco, Calif.

Filed May 13, 1976, Ser. No. 686,130

Int. Cl.² B23B *47/28, 49/02*

U.S. Cl. 408—115 B **8 Claims**

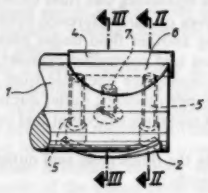


1. An adjustable drill guide assembly for use in drilling holes in wooden utility poles comprising a pair of parallelly aligned longitudinal members each having a series of longitudinally spaced apart holes, a plurality of V-shaped brackets slideably connected at their ends between the members, positioning pins located in the ends of the V-shaped brackets and disposable into the holes in the members, so that the V-shaped brackets can be spaced apart at a desired distance from one another along the members, holders disposed perpendicularly to the members on the V-shaped brackets, drill guide bushings fitting into the holders, and chain tightener means running from one member around the pole and attaching to the opposite member for holding the assembly on the pole.

4,030,855
REAMING TOOL

Dieter Kress, Aalen, Germany, assignor to Mapal Dr. Kress KG, Aalen, Germany

Filed Dec. 5, 1973, Ser. No. 421,955
Claims priority, application Germany, Dec. 11, 1972, 2260470
Int. Cl.² B23B 51/00
U.S. Cl. 408—226 6 Claims

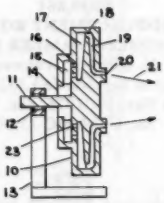


1. A reaming tool comprising:
a. a shank having an axis and an axially terminal head portion;
b. a single blade fastened to said head portion,
1. said blade having a cutting edge elongated in the direction of said axis, radially projecting from said shank, and facing in a circumferential cutting direction; and
c. two guide ribs fastened to said head portion,
1. said guide ribs being each elongated in a helix about said axis and radially projecting from said head portion in circumferentially spaced relationship.
2. the projecting portions of said guide ribs being axially coextensive with said cutting edge over substantially the entire length of said cutting edge and radially coextensive with said cutting edge,
3. one of said guide ribs and said cutting edge projecting from said head portion in diametrically opposite directions,
4. the other guide rib being offset from said cutting edge in a direction opposite to said cutting direction,
5. the angular center-to-center spacing of said guide ribs relative to said axis being much greater than the angular spacing of the circumferential center of said other guide rib from said cutting edge.

4,030,856
ROTOR WITH JET NOZZLES

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 568,895, April 17, 1975, Pat. No. 4,003,673. This application Feb. 20, 1976, Ser. No. 659,797
Int. Cl.² F01D 1/18
U.S. Cl. 415—80 5 Claims

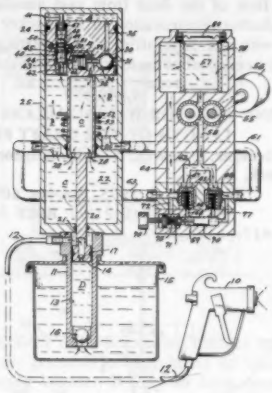


1. In a rotating rotor, wherein a working fluid enters said rotor through an entry and is accelerated by said rotor, the improvement comprising:
a. discharging said working fluid through an inwardly extending fluid passage, with said passage being arranged to allow movement of said working fluid forwardly in the direction of rotation for additional acceleration of said working fluid, with said working fluid being discharged from said rotor via an exit opening communicating with the inward end of said fluid passage.

4,030,857
PAINT PUMP FOR AIRLESS SPRAY GUNS

Gary C. Smith, Jr., Oregon, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Oct. 29, 1975, Ser. No. 626,742
Int. Cl.² F04B 49/00
U.S. Cl. 417—46 3 Claims

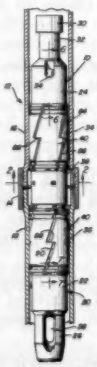


1. A system for supplying paint to a spray gun comprising, in combination, a paint pump, a hydraulic motor for actuating said paint pump, a hydraulic pump having a discharge line for supplying liquid to actuate said hydraulic motor, control means for regulating said hydraulic pump output comprising an unloading mechanism responsive to a predetermined pressure in the discharge line between said hydraulic pump and said hydraulic motor to open a bypass passage from said discharge line to the inlet side of said hydraulic pump, said unloading mechanism including a normally closed cup-shaped bypass valve in said bypass passage, said valve having an orifice in its head which, when fluid flows therethrough reduces the pressure beneath said valve and holds the valve in an open position, so long as flow in said bypass passage persists, whereby said hydraulic pump operates at substantually no load so long as said predetermined pressure persists in said discharge line, and means to adjust the predetermined pressure at which said unloading mechanism operates.

4,030,858
MULTI-STAGE RABBIT

Otis C. Coles, Jr., P.O. Box 12155, El Paso, Tex. 79912

Filed Sept. 29, 1975, Ser. No. 617,715
Int. Cl.² F04B 47/12
U.S. Cl. 417—56 13 Claims



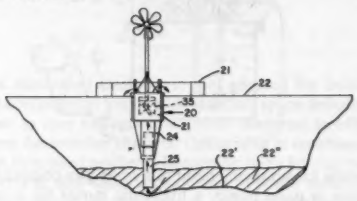
1. A plunger assembly adapted to be pneumatically reciprocated within an eductor tube string along a longitudinal axis

for lifting fluid in an annular passage formed between the tube string and the plunger assembly, comprising an elongated mandrel having a radially enlarged section adjacent an upper longitudinal end thereof, and a radially expansible packer device mounted on the mandrel in abutment with said radially enlarged section for wiping engagement with the tube string, and packer device including passage means responsive to directed flow of the fluid from said annular passage therethrough during reciprocation of the packer device in wiping contact with the tube string for imparting rotation to the plunger assembly about said longitudinal axis.

4,030,859
FLOATING AERATOR HAVING MEANS TO VARY THE LENGTH OF THE DRAFT PIPE

Dale L. Henegar, Bismarck, N. Dak., assignor to Lake Aid Inc., Bismarck, N. Dak.

Filed Sept. 2, 1975, Ser. No. 609,581
Int. Cl.² F04B *21/00*; **B01F** *3/04*
U.S. Cl. 417—61 **4 Claims**



1. A water circulating device for circulating and aerating the water in a lake, a pond, or reservoir comprising a floatation raft, a shaft rotatably mounted on said raft to rotate about a vertical axis, a wind drive motor for driving said shaft, a cylindrical mixing chamber mounted beneath said raft, said chamber having a cylindrical side wall and a bottom wall and having an opening formed by the side walls upper edge located above the surface of the lake, pond, or reservoir, said shaft projecting downward into said mixing chamber, a propellor mounted to the lower end of said shaft within the mixing chamber, a plurality of vertically elongated pipes, said plurality including uppermost and lowermost pipes, said pipes being mounted in telescoping relation with the uppermost pipe fixed to the bottom of the mixing chamber, said chamber having an opening in the bottom communicating with said uppermost pipe, said lowermost pipe being slidably mounted relative to said raft and said uppermost pipe, means on said raft to selectively adjust said lowermost pipe upward and downward relative to the raft and the uppermost pipe and relative to the bottom of the lake so that the lowermost edge of the lowermost pipe may be located near the bottom of the lake, said propellor having pitched blades, so that upon rotation of the propellor in the chamber by the wind driven motor rotating the shaft, the propellor in the chamber will draw water up from the bottom of the lake into the lower end of the lowermost pipe up through the plurality of pipes into the mixing chamber, with the water moving upward to the surface and over the upper edge of the side wall to aerate the water.

4,030,860
VARIABLE PROPORTIONAL METERING APPARATUS

Ronald E. Standlick, 4506 Sudbury St., Warren, Mich. 48092

Filed Mar. 15, 1976, Ser. No. 666,747
Int. Cl.² F04B *35/00, 23/06, 7/02, 21/02*
U.S. Cl. 417—63 **3 Claims**

1. An apparatus for metering proportional quantities of two fluids to obtain a desired mixture of the fluids, comprising,

a reference cylinder having opposite ends, a piston, and a piston rod,

a controlled cylinder having opposite ends, a piston, and a piston rod,

a beam having opposite ends, a pin pivotally mounting said beam intermediate its said ends,

means pivotally connected said piston rods to said opposite ends of said beam whereby the travel directions of said pistons in said cylinder is controlled proportional to one another with said pistons moving in opposite directions;

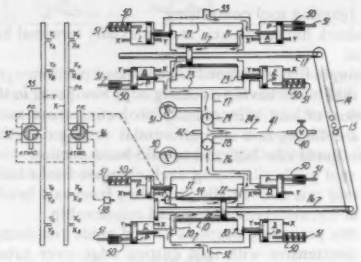
said beam controlling proportional travel of said pistons to provide metering of proportional quantities of said fluids,

a bi-directionally powered inlet valve on each end of each said cylinder; a bi-directionally powered outlet valve on each end of each said cylinder;

supply ducts for furnishing one fluid under pressure to both said inlet valves on said reference cylinder; supply ducts for furnishing another fluid under pressure to both said inlet valves on said controlled cylinder;

outlet ducts receiving the one fluid from said outlet valves on said reference cylinder; outlet ducts for receiving the other fluid at said outlet valves at said controlled cylinder; and

means receiving the fluids from said outlet ducts for mixing the fluids together,



each said inlet valve on one end of each said cylinder being cross-paired with one said outlet valve on the opposite end of each said cylinder;

power means for operating said valves between open and closed positions; and

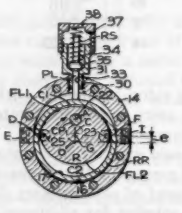
control means for closing one cross-pair of said valves and opening said other cross-pair of said valves on both said cylinders in one direction of opposite travel of said pistons so that fluids under pressure introduced at one said end of each said cylinder cause said pistons to move and to force the fluids out said other end of said cylinders;

said control means reversing the condition of said valves in the opposite direction of travel of said pistons from open-to-closed and from closed-to-open so that the fluids under pressure are introduced at the opposite ends of said cylinders causing said pistons to move in the opposite direction of travel to force fluids out the opposite ends of said cylinders.

4,030,861
VARIABLE DISPLACEMENT ROTARY PISTON EXPANSIBLE CHAMBER DEVICE

A. Frank Putz, 401 N. 89th St., Wauwatosa, Wis. 53226

Continuation-in-part of Ser. No. 553,332, Dec. 16, 1974. This application Nov. 17, 1975, Ser. No. 632,853
Int. Cl.² F04C *15/00*
U.S. Cl. 418—27 **38 Claims**



1. A rotary piston, variable volume device comprising, in combination,

a housing having an elongated cavity therein and spaced inlet and exhaust ports which communicate with said cavity,

a shaft rotatably journalled in said housing and extending into said cavity,

a chamber-defining member positioned within said cavity and having an internal cylindrical bore surrounding said shaft whose cross section is a closed curve,

a cylindrical rotary piston rotatable within said bore with its axis parallel to the shaft axis and having first and second arcuately spaced apices which divide said bore into first and second variable volume chambers on opposite sides of said rotary piston,

means including a force transmitting member carried by said shaft for operatively coupling said piston to said shaft so that they rotate together in a one-to-one ratio while concurrently permitting rocking movement of said rotary piston relative to said force transmitting member and to said shaft about a surface radially removed from the geometric center of the piston cross section and so that said first and second apices remain in continuous contact with said bore in all positions of said shaft, said force transmitting member constituting the sole motion controlling means between said shaft and said rotary piston and said first and second apices being cammed on said bore so that said rotary piston reciprocates within said bore as it rotates together with said shaft and varies the volumes of said first and second chambers inversely from minimum to maximum and back to minimum during each revolution of said shaft, said chamber-defining member being movable within said cavity in a direction longitudinal of said cavity to vary the eccentricity between the axis of said shaft and the center of said closed curve defining said bore cross section and thus change the volumetric displacement of said device.

4,030,862

HELICAL GEAR PUMP AND METHOD OF MANUFACTURING THE SAME

Erik Larsson, Dalagatan 86A, 113 43 Stockholm, Sweden

Filed Apr. 21, 1975, Ser. No. 569,670

Claims priority, application Sweden, Apr. 22, 1974, 7405395

Int. Cl.² F01C *1/10, 21/08*; F04C *1/06*; B23P *15/10*

U.S. Cl. 418—48 **6 Claims**

1. Helical gear pump having a single-threaded rotor screw which is rotatable in a stator which is internally double-threaded, each stator thread having twice as large pitch as the thread of the rotor screw, said rotor screw having a configuration substantially identical to that obtained by winding a wire or bar having a uniform, circular cross-section into a cylindrical helix, the outer diameter of said rotor screw being about twice as large as the diameter of said wire or bar, said bar or wire having a non-circular configuration within a cross-section plane drawn normal to the central axis defined by said cylindrical helix.

4,030,863

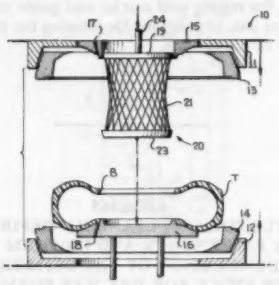
VENTING RETAINER FOR CURING TUBE

Kenneth T. MacMillan, 4992 Wesleyan Woods Drive, Macon, Ga. 31201

Filed July 19, 1976, Ser. No. 706,374

Int. Cl.² B29H *5/02, 5/04*

U.S. Cl. 425—17 **20 Claims**



1. A venting retainer for a tire curing bladder comprising means for generally porously encapsulating an exterior surface of a tire curing bladder to vent air from between the exterior surface of the bladder and the tire interior, said encapsulating means being an element made separately from the bladder.

4,030,864

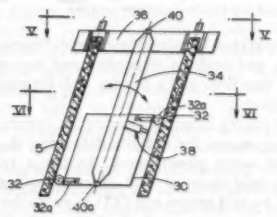
APPARATUS FOR MAKING INCLINED HOLLOW CONCRETE COLUMNS USING SLIDING FORMWORK

Tomas Berge Einstabland, Asker, and Torlak Opedal, Hosle, both of Norway, assignors to Ingenior F. Selmer A/S, Oslo, Norway

Filed June 24, 1975, Ser. No. 589,833

Int. Cl.² E046 *11/28*

U.S. Cl. 425—65 **5 Claims**



1. An apparatus for molding inclined free-standing hollow columns of concrete, said apparatus comprising:

a slip form unit positionable above an already formed solidified section of a column and serving as a mold for the formation of additional sections of the column;

a combined carrier and guide means supporting at an upper portion thereof said slip form unit, said carrier and guide means comprising a lower portion adapted to be positioned within the column, a support stem pivoted at the lower end thereto to said lower portion, and a platform pivoted to an upper portion of said stem, said slip form unit being supported by said platform;

means, mounted on said carrier and guide means and adapted to contact the inner surface of the already formed solidified section of the column, for imparting a lateral displacement to said carrier and guide means and to said slip form unit and for thereby controlling and adjusting the inclination of said slip form unit, with re-

spect to the already formed solidified section of the column, for molding the next additional section of the column;

steering means between said lower portion of said carrier and guide means and said stem for selectively pivoting said stem about the pivot connection thereof with said lower portion; and

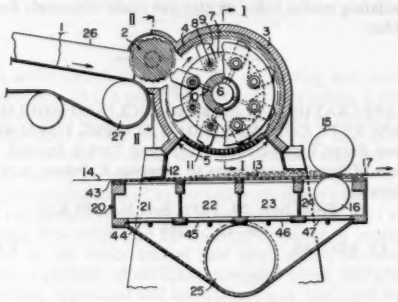
means, operatively connected to said carrier and guide means, for raising said carrier and guide means and said slip form unit to positions for forming the next additional section of the column.

4,030,865

APPARATUS FOR SIMULTANEOUS DEFIBERIZATION OF WASTE PAPER STOCK AND UNIFORM DISPERSION AND ACCUMULATION OF THE DEFIBERIZED FINE FIBER STOCK FOR DRY WEB FORMATION

Tadashi Kobayashi, 1560-2 Tenma, Fuji, Shizuoka, Japan

Filed July 3, 1975, Ser. No. 592,910
Claims priority, application Japan, July 8, 1974, 49-77413
Int. Cl.² B29C *13/00*; B29D *7/00*
U.S. Cl. 425—82 **1 Claim**



1. An apparatus for simultaneous defiberization of waste paper stock and uniform dispersion and accumulation of the defiberized fine fiber stock for dry web formation comprising in combination:

a. a defiberizing drum (3) having an opening therein, conveyoring means for radially delivering thereinto roughly crushed waste paper stock, having a return roll (27) outside said drum at said opening, and a feed belt (1) guided by said return roll (27) to guide the paper stock to said drum, a saw-tooth feed gear (2) in said opening above said return roll (27) for feeding the paper stock, into said drum, inner cylindrical teeth (4) disposed inside the drum circumference with a lower outlet section (5) having drop apertures (11) therein for the delivery of said defiberized fine stock formed through said section (5);

b. a hollow rotary shaft (6) rotatably disposed in said defiberizing drum;

c. a multitude of swing hammers (9) affixed swingably around said hollow rotary shaft (6) both circumferentially and axially at respectively regular intervals, said swing hammers (9) having milling edges (38) formed at the top facing said teeth (4) with a suitable clearance maintained between said edges (38) and said teeth (4);

d. air vents (10) on the hollow rotary shaft for passing outer air through said shaft to the inside of said drum; and,

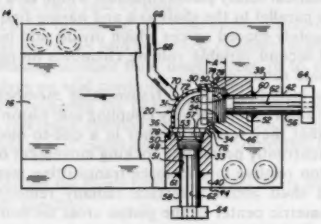
e. a suction wire sheet (43) for receiving and supporting a thin paper sheet to receive and accumulate fine stock thereon, said suction wire sheet (43) being disposed under said drop apertures (11).

4,030,866

MOLDING APPARATUS

Edward A. Madej, Verona, Pa., assignor to Robroy Industries, Verona, Pa.

Filed Nov. 24, 1975, Ser. No. 634,516
Int. Cl.² B29C *27/14*
U.S. Cl. 425—116 **8 Claims**



1. In a molding apparatus for applying a protective coating to an irregularly sized article comprising,

a shell having upper and lower body portions,

said upper and lower shell portions each having a cavity of a preselected configuration to receive an article for coating,

a fluid inlet extending through said shell into said cavities,

connecting means for securing together said upper and lower shell portions to position said cavities in overlying relation and surrounding an article to be coated, said secured shells provide a mold cavity and openings extending through said respective shell portions into said mold cavity,

seal means for sealing said openings in said mold cavity,

an article to be coated housed within said mold cavity and carrying therewith said seal means on its end portions being secured to the end portions of the article to be coated within said cavities to retain the article in spaced relation with said shell portions and to form an annular molding surface which surrounds the article and terminates adjacent the end portions thereof in radially extending annular portions,

a moisture resistant, resilient polymeric liquid adapted to be introduced through said fluid inlet to fill said cavity and occupy the annular molding surface thus surrounding the article and forming a resilient polymeric coating on the surface of the article, and

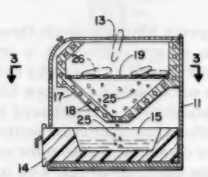
providing annular resilient portions extending radially on the end portions of the article.

4,030,867

APPARATUS FOR FORMING A BAR OF SOAP FROM LEFTOVER PIECES

Don D. Everman, California, Md., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

Filed July 19, 1976, Ser. No. 706,140
Int. Cl.² B29C *5/00*; B29B *5/06*; C11D *13/16*
U.S. Cl. 425—144 **6 Claims**



1. Apparatus for molding soap bars from leftover pieces of

soap, comprising an outer casing with a hinged and slotted door in the upper surface thereof;

an open topped hopper fixed within the casing under the slotted door, said hopper including insulating walls defining a chute at the bottom thereof;

an apertured partition, extending laterally within the hopper so as to retain the pieces of soap within the hopper when they are introduced through the slotted door;

a mold slideably positioned within the casing, below the chute and adapted for being withdrawn through an aperture in the casing;

heating means, so situated within the hopper as to melt the pieces of soap resting on the partition;

control means for activating and deactivating the heating means; and

weight sensing means for sensing the weight of the pieces of soap and providing a triggering signal to the control means when the weight of the accumulated pieces of soap is equal to the weight of a complete bar, whereby the pieces of soap are then melted, the molten soap flowing through the apertured partition, down the chute and into the mold to form a new bar whereupon the heater is deactivated.

4,030,868

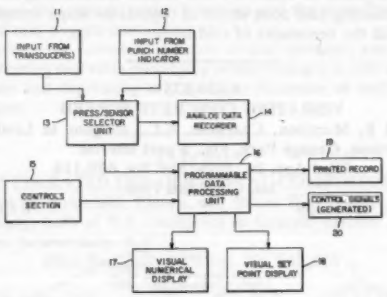
FORCE MEASUREMENT AND ANALYSIS PARTICULARLY RELATING TO ROTARY TABLET PRESSES

Joseph James Williams, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 15, 1976, Ser. No. 666,734

Int. Cl.² B29C *3/06*

U.S. Cl. 425—149 **41 Claims**



1. Instrumentation for use in connection with tablet presses having at least one tablet die and an associated punch set, such as high-speed rotary tablet presses, comprising:

a. first means operatively connected with a tablet press for obtaining tablet formation information representative of one or more tabletting events from any tablet die/punch set combination of said press and for identifying said tablet die/punch set combination;

b. second means connected to said first means for converting the tablet formation information into a convenient first data form; and

c. data processing means connected to said second means for processing in a pre-established manner said tablet formation information in said first data form and providing output signals representative thereof, including, where appropriate, tablet press control signals, said data processing means including third means for selectively making available for processing tablet formation information from a desired one or more of the tablet press die/punch set combinations.

4,030,869

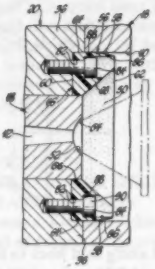
LOCATING RING FOR INJECTION MOLDS

Leonard G. Miller, Bloomfield Hills, and Raymond P. Hale, St. Clair Shores, both of Mich., assignors to Molmec, Inc., Walled Lake, Mich.

Filed July 15, 1975, Ser. No. 596,078

Int. Cl.² B29F *1/022*

U.S. Cl. 425—247 **14 Claims**



1. An injection molding assembly for injection molding plastic components and comprising; a stationary platen having an opening therein, a movable platen, a first mold part having an inlet passage and supported on said stationary platen, a second mold part supported on said movable platen for movement into and out of engagement with said first mold part, an injection nozzle disposed in said opening for injecting plastic material into said inlet passage in said first mold part, an annular locating ring attached to said first mold part and disposed in said opening for locating said first mold part relative to said stationary platen, said locating ring being made of plastic, said locating ring including an outer peripheral surface engaging said opening in said stationary platen for positioning said first mold part relative to said stationary platen, said outer peripheral surface of said locating ring including a tapered portion extending radially inwardly for guiding said locating ring into said opening in said stationary platen, said locating ring including a first face engaging said first mold part and a second face spaced therefrom and disposed in said opening in said stationary platen, said outer peripheral surface including an axially extending portion extending from said first face toward said second face and terminating at said tapered portion, said tapered portion extending radially inwardly from said axially extending portion to said second face, said axially extending portion being in abutting engagement with said opening in said stationary platen to prevent transverse movement of said first mold part relative to said stationary platen, said locating ring including a central opening therethrough, said central opening including an inclined portion extending radially inwardly from said second face thereof, said locating ring including cavities extending thereinto from said first face thereof to define an outer annular wall defining said outer peripheral surface and an inner annular wall defining said central opening and a base connecting said annular walls and defining said second face and ribs extending between said annular walls and said base.

4,030,870

REFRIGERATOR CONSTRUCTION AND THE MANUFACTURE OF PANELS THEREFOR

Donald A. Bunce, Wirral, England, assignor to Kelvinator, Inc., Grand Rapids, Mich.

Filed Oct. 15, 1974, Ser. No. 514,831

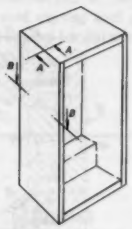
Claims priority, application United Kingdom, Feb. 21, 1974, 7914/74

Int. Cl.² B29C *17/02*

U.S. Cl. 425—383 **11 Claims**

1. An apparatus for forming thermoplastic panels for refrigerators, freezers or the like comprising clamp means for

clamping in a fixed position a flat sheet of thermoplastic material, said sheet having a plurality of peripheral edges, heater means operable to simultaneously heat selected peripheral portions of said sheet along at least two spaced lines, said lines being adjacent and parallel to each other and to at least one of said edges, and fold means operable to fold peripheral portions of said sheet along said lines to form a channel of predetermined width, said fold means initially applying a force to a relatively unheated peripheral portion of said sheet after said selected peripheral portions have been heated, said force causing peripheral portions of said sheet to fold along said lines.



4,030,871

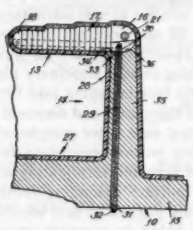
MOLD APPARATUS

John Farley Cobb, Van Buren, Ark., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 23, 1976, Ser. No. 699,082

Int. Cl.² B29C *17/04*

U.S. Cl. 425—388 **6 Claims**



1. Mold apparatus for thermoforming an article to include a first hollow portion which is spaced from and overhangs a second portion of said article, said mold apparatus comprising:

a plurality of mold elements including a first, carrier element having a base portion and a turned portion projecting from said base portion, and a second element movably mounted to the distal end of said turned carrier portion, and comprising a plurality of segments;

first spring means for urging said segments yieldably into a series stacked arrangement, second spring means for yieldably urging said series stacked arrangement into a preselected turned relationship with said turned portion of the carrier to define a resiliently flexible returned mold, said mold elements cooperatively defining a mold apparatus about which a sheet may be thermoformed to define a wall having a hollow turned projection on a base and a returned hollow portion extending from the distal end of the turned projection and being spaced from and overhanging said base, said first and second spring means cooperatively permitting facilitated removal of said elements from said hollow molded article portion by permitting turning of said elements relative to each other during such removal.

4,030,872

COMBINED MOULD ELEMENT AND SEALING RING

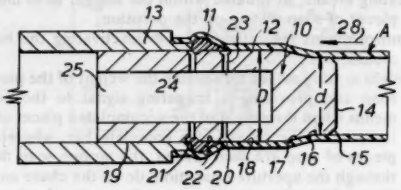
Gunnar Parmann, Mathopen, Norway, assignor to Rieber & Son Plastic-Industri A/S, Bergen, Norway

Filed Aug. 28, 1975, Ser. No. 608,758

Claims priority, application Norway, Sept. 2, 1974, 743130; Nov. 4, 1974, 743955; Nov. 4, 1974, 743954; Apr. 24, 1975, 751460

Int. Cl.² B29C *17/00*

U.S. Cl. 425—393 **32 Claims**



1. A combined mould element and sealing ring, suitable for sealing off a joint between a socket end and an insert end of two cooperating pipes formed from thermoplastic material

and for being used as a portion of a body of a mould for both fabricating said socket end of the one pipe and simultaneously inserting said ring in an internal groove in the socket end produced thereby,

said combined mould element and sealing ring having inner and outer surfaces defining therebetween a unitary body,

the main bulk of said body being composed of elastically yielding material,

whereas said body has within its contour at least one zone composed of relatively non-elastic material capable of rendering said zone stable as regards its shape compared with the remainder of said body.

4,030,873

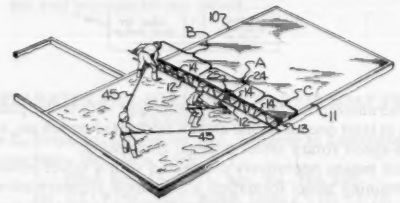
VIBRATING CONCRETE SCREED

Donald R. Morrison, Charlotte, N.C., assignor to Lewis T. Morrison, Orange Park, Fla., a part interest

Filed Apr. 26, 1976, Ser. No. 680,116

Int. Cl.² B28B *1/08*

U.S. Cl. 425—456 **8 Claims**



1. A vibrating concrete screed comprising

a. an elongate open structure frame including a pair of spaced apart screed plates adapted to engage and level concrete as said screed is moved over the concrete,

b. bearings fixed on said frame and spaced inwardly from each end of said frame,

c. a vibrating element consisting of a semiflexible shaft loosely supported for rotation in said bearings and extending throughout the length of said frame and beyond said bearings spaced inwardly from each end of said frame, and

d. drive means carried by said frame for rotating said shaft at a sufficient speed to cause deflection of the portions of said shaft between and beyond said bearings and to im-

part uniform vibrations throughout the lengths of each of said screed plates.

4,030,874

METHOD OF AND APPARATUS FOR CONTROLLING COMBUSTION

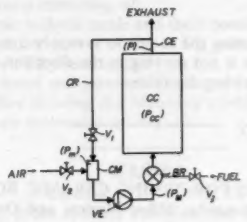
Bernard Vollerin, Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge, Geneva, Switzerland

Filed Apr. 22, 1976, Ser. No. 679,100

Claims priority, application Switzerland, Dec. 15, 1975, 16207/75

Int. Cl.² F23M *9/00*

U.S. Cl. 431—9 **10 Claims**



1. A method of operating a combustion chamber comprising the steps of:

feeding a fluid combustible with a combustion-sustaining gas to said chamber and burning said combustible therewith to form an exhaust gas in said chamber mixing a recirculated portion of said exhaust gas with an oxygen-containing gas to form said combustion-sustaining gas and feeding the mixture underpressure into said chamber;

establishing a predetermined normal ratio between the mass-flow rate of said exhaust gas and the mass-flow rate of said oxygen-containing gas.

continuously detecting pressure in said chamber; and

increasing said ratio on surging of the pressure in said chamber and decreasing said ratio on recession of said pressure.

4,030,875

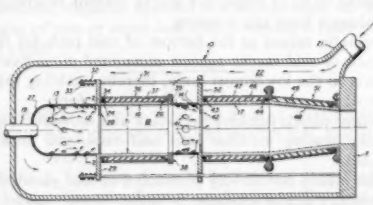
INTEGRATED CERAMIC-METAL COMBUSTOR

Clayton M. Grondahl, Elnora, and Bruce W. Gerhold, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,540

Int. Cl.² F23D *15/02*

U.S. Cl. 431—352 **11 Claims**



1. In a gas turbine combustion apparatus wherein said combustion apparatus is lined on the inside with a layer of ceramic material confining the sequential zones of combustion maintained downstream of means for introducing fuel into said combustion apparatus, means are provided in flow communication with the outside of the combustion liner for supplying air, holes are located passing through the combustion liner in flow communication with said means for supplying air for the transport of air through said combustion liner into said combustion apparatus and means are disposed at the downstream end of said combustion apparatus for conducting the combustion products from said combustion liner into a turbine structure, the improvement comprising:

a continuous combustion liner construction in which at least one metal liner length and one ceramic liner length are disposed in series, said one metal liner length being disposed upstream of said one ceramic liner length;

each ceramic liner length being free of holes through the wall thereof in flow communication with said means for supplying air, the requisite holes being located in each metal liner length employed.

4,030,876

METHOD AND APPARATUS FOR REGENERATING ACTIVATED CARBON

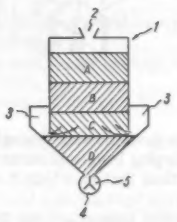
Kiyoshi Akae, Kyoto; Masaya Kitada, Nishinomiya, and Yoshiyuki Uno, Ibaraki, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed June 10, 1975, Ser. No. 585,458

Claims priority, application Japan, June 12, 1974, 49-67410; Jan. 23, 1975, 50-11118

Int. Cl.² F27B *15/00*

U.S. Cl. 432—14 **7 Claims**



1. A method for regenerating activated carbon using a furnace of the columnar type having a treatment chamber of substantially uniform sectional shape and area along a vertical direction and having an upper end provided with a spent carbon feed port and lower end provided with reactivated carbon delivery port comprising the steps of:

feeding through said feed port spent carbon having a bulk density of at least 0.35g/cm³, a particle size distribution of 5 to 40 mesh and a water content of 50% to 120% by weight;

discharging carbon from said delivery port so as to cause a stabilized downward movement of the spent carbon in said chamber; and,

forming drying, burning and reviving treatment zones through which the carbon successively passes in its stabilized downward movement through said chamber by introducing a high temperature combustion gas to said chamber at the lower portion of said reviving treatment zone so as to cause said gas to flow upwardly through and substantially uniformly contact the stabilized downwardly moving carbon and so as to heat said carbon to a maximum temperature of about 900°C in said reviving treatment zone.

4,030,877

FURNACE WASTE GAS HEAT RECOVERY DEVICE AND METHOD OF USING SAME

Philip W. Robinson, 7831 Seventh St., Downey, Calif. 90241

Filed Nov. 26, 1975, Ser. No. 635,342

Int. Cl.² F24H *7/02*; **F24J** *3/00*; **F24H** *1/00*

U.S. Cl. 432—29 **8 Claims**

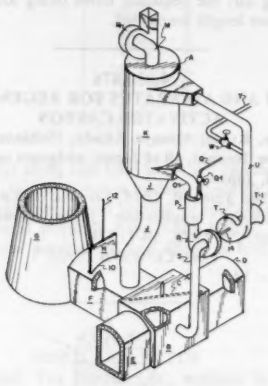
6. A method of recovering heat from hot waste gases that

flow from a heat emitting device to a stack said device being heated by fuel mixed with air, said method including the steps of:

a. diverting at least a portion of said hot waste gases to a plurality of first passages defined by a heat conducting material;

b. drawing said hot waste gases through said first passages at a desired velocity;

c. discharging air under pressure from the ambient atmosphere into a plurality of second passages to be heated by



said hot waste gases flowing through said first passages, said air discharging from said second passages at a pressure greater than that as which it entered said second passages;

d. transforming hot pressurized air discharging from said second passages into rotational power;

e. using said rotational power to pressurize air from the ambient atmosphere entering said second passages; and

f. mixing said hot pressurized air after said transformation with said fuel prior to the latter burning to heat said heat emitting device.

4,030,878

METHOD AND APPARATUS FOR THE CONNECTION OF A ROTARY DRUM DRIVE OF A ROTARY FURNACE

Paul Kunath, Cologne, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Jan. 20, 1976, Ser. No. 650,619

Claims priority, application Germany, Jan. 23, 1975, 2502612

Int. Cl.² F27B *7/00, 9/40*

U.S. Cl. 432—45 **19 Claims**

1. A method of reconnecting the armature of a motor to an electrical supply shortly after disconnection, in an installation in which the motor drives a rotary drum which undergoes damped oscillations after disconnection, and before the drum damps to a standstill condition, comprising the steps of:

measuring the direction of movement of the oscillating drum; and

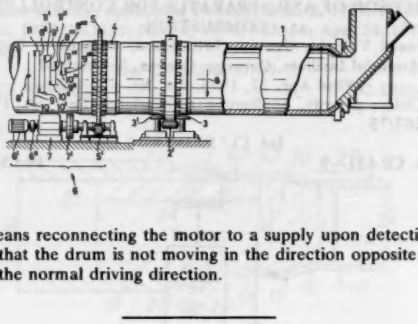
reconnecting the armature to the supply upon detection that the drum is not moving in a direction opposite to the normal driving direction.

19. An installation comprising:

a rotary drum which undergoes damped oscillating motion when a driving force is removed;

a drive motor coupled to said drum;

means measuring the direction of movement of the oscillating drum; and



means reconnecting the motor to a supply upon detection that the drum is not moving in the direction opposite to the normal driving direction.

4,030,879

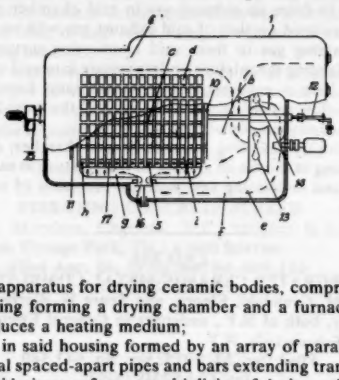
APPARATUS FOR DRYING CERAMIC BODIES

Virgil Corneliu Stanasila; Mihai Florica, and Onut Antoniu Lungu, all of Bucharest, Romania, assignors to Institutul de Cercetare Proiectare si Documentare Pentru Industria Materialelor de Constructii, Bucharest, Romania

Filed Oct. 24, 1975, Ser. No. 625,668

Int. Cl.² F27B *9/00*

U.S. Cl. 432—144 **4 Claims**



1. An apparatus for drying ceramic bodies, comprising:

a housing forming a drying chamber and a furnace which produces a heating medium;

a rack in said housing formed by an array of parallel horizontal spaced-apart pipes and bars extending transversely to said pipes to form a multiplicity of drying columns;

a platform vertically displaceable beneath said rack and adapted to be lowered to discharge the lowermost ceramic body of respective stacks thereof received in said columns from said housing;

pneumatic means at the bottom of said rack for retaining each of said stacks against downward movement at the next to the lowermost body, thereby enabling the lowermost body to be removed on said platform;

a pair of panels flanking said stack and movable to displace said heating medium into said rack and around said stacks;

crank means operatively connected to said panels for periodically displacing same to impart movement to the medium in said rack; and

means for circulating said medium through said chamber and said pipes and for removing excess medium from said chamber, said pipes being provided with opening discharging said medium in the region of said stacks.

4,030,880

PROCESS FOR IMPROVING DYEABILITY

Winfried Thomas Holfeld, Wilmington, and Alfred John Strohmaier, Seaford, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 9, 1975, Ser. No. 621,089
Int. Cl.² D06P *1/00*
U.S. Cl. 8—15 5 Claims

1. In a melt-spinning and drawing process for the preparation of synthetic polycarbonamide filaments, the improvement for achieving more uniform acid dyeability comprising applying to the filaments, prior to drawing, a finish in an amount to provide from 0.05 to 0.5% by weight of the filaments of at least one dye-leveling agent containing at least 1.0 milliequivalents per gram of a sulfonic or sulfate group and selected from the group consisting of:

a. aromatic sulfonic acids and their condensation products;

b. sulfated derivatives of C_{16} to C_{22} unsaturated fatty acids and their alkyl esters; and

c. alkali metal and ammonium salts of (a) and (b),

and thereafter drawing the filaments containing the finish to increase their molecular orientation.

4,030,881

COLORATION PROCESS

Violet Boyd; Brian Ribbons Fishwick, and Brian Glover, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 8, 1975, Ser. No. 620,694
Claims priority, application United Kingdom, Oct. 31, 1974, 47112/74; Mar. 25, 1975, 12425/75
Int. Cl.² C09B *1/00, 5/62;* D06P *5/02*
U.S. Cl. 8—39 C 3 Claims

1. Process for the coloration of aromatic polyester or cellulose triacetate textile materials which comprises applying to the said textile materials by an aqueous dyeing, padding or printing process an aqueous dispersion of a disperse anthraquinone or azo dyestuff free from carboxylic acid or sulphonic acid groups, said dyestuff containing from 2 to 4 carboxylic acid ester groups, and subsequently giving the colored textile material a treatment in an aqueous solution of an alkali metal hydroxide or alkali metal carbonate having a pH above 8 and at a temperature between 50° and 85° C.

4,030,882

SOLVENT DYEING COMPOSITIONS AND A METHOD OF DYEING POLYESTER FIBERS THEREWITH

Samuel E. Blackwell, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,071
Int. Cl.² C09B *1/00, 5/62*
U.S. Cl. 8—39 R 5 Claims

1. A composition useful in nonaqueous, hydrophobic solvent dyeing comprising from 5–75 parts by weight of at least one nonionic, disperse dye and conversely from 95–25 parts by weight of one or more surfactants having a HLB rating of four to eight.

4,030,883

PROCESS FOR TREATING NATURAL POLYAMIDE FIBRES OF ASYMMETRIC STRUCTURE, SUCH AS WOOL, WITH LIQUID AMMONIA

Maryvonne J. Vaesken; Alain E. Bultez, and Jean-Paul Dalle, all of Saint Quentin, France, assignors to Opi Cryochimie S.A., Grugies, France

Filed Feb. 4, 1975, Ser. No. 546,902
Claims priority, application France, Feb. 4, 1974, 74.03571
Int. Cl.² D06M *1/18*
U.S. Cl. 8—115.5 3 Claims

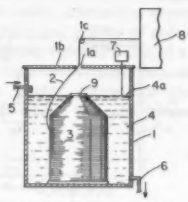
1. In a process for treating natural polyamidic fibers of asymmetric structure wherein the fibers are treated with liquid ammonia in order to improve their properties, the improvement consisting of contacting said fibers with liquid ammonia containing an effective amount of an acid or salt containing an acetate or chloride anion for from 5 to 30 minutes.

4,030,884

METHOD FOR CONTINUOUSLY WASHING A YARN WITH A WASHING LIQUID

Yasunori Nagata, Osaka; Hirotaka Itoh, Neyagawa; Susumu Yazaki, Settsu; Takayuki Hamamura, Kyoto, and Shigeo Yoshiya, Fujiidera, all of Japan, assignors to Kanebo, Ltd., Japan

Division of Ser. No. 465,611, April 30, 1974, Pat. No. 3,964,279. This application Jan. 22, 1976, Ser. No. 651,575
Claims priority, application Japan, May 7, 1973, 48-50514; July 4, 1973, 48-75567; Nov. 21, 1973, 48-131306
Int. Cl.² D06B *1/04*
U.S. Cl. 8—151.2 6 Claims



1. A method for continuously washing a yarn with a washing liquid, comprising the steps of:

standing upright a yarn supply package in which the yarn is wound on a bobbin,

continuously drawing off the yarn from said yarn package upwardly, and,

supplying, concurrently with said drawing operation, a washing liquid to a top end of said yarn package while allowing said washing liquid to flow downwardly from said top end of said yarn package over the outer surface of said yarn package, a portion of said washing liquid being allowed to penetrate into said yarn package.

4,030,885

BILIRUBIN DETERMINATION

Manik L. Das, Crestwood, Mo., assignor to Sigma Chemical Company, St. Louis, Mo.

Filed Sept. 11, 1975, Ser. No. 612,300
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B 8 Claims

1. In a method for colorimetrically determining bilirubin in a sample solution wherein the color of the azobilirubin formed from the coupling reaction of diazo reagent with bilirubin is measured, the improvement comprising adding a sulfhydryl compound to the sample solution after the azobilirubin has formed therein.

4,030,886

SATURATION ANALYSIS

Russell James Bayly; Virginia Edith May Chambers, and Reginald Monks, all of Amersham, England, assignors to The Radiochemical Centre Limited, England

Filed Dec. 5, 1974, Ser. No. 530,021
Claims priority, application United Kingdom, Dec. 11, 1973, 57433/73
Int. Cl.² C07J *1/00, 5/00;* G01N *33/16;* G01T *1/00*
U.S. Cl. 23—230.6 5 Claims

1. A method of performing a saturation analysis of a steroidal compound by causing the compound which is to be analysed and a radioactively labelled version of the said compound to compete for reaction with a specific reagent for the said compound, which is present in an amount insufficient to combine with all of said compound and the labelled version

thereof, separating the bound compound from the unbound compound and measuring the radioactive concentration of one or both of the bound and unbound compound,

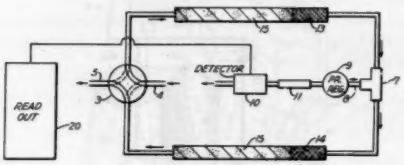
characterized in that the radioactively labelled version of the steroidal compound is labelled with selenium - 75.

4,030,887

CARBON MONOXIDE DETECTION APPARATUS AND METHOD

Albert A. Poli, Pittsburgh; Clayton J. Bossart, Monroeville, and Thomas P. Benzie, Pittsburgh, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed June 18, 1976, Ser. No. 697,381
Int. Cl.² G01N *31/06, 31/10*
U.S. Cl. 23—232 E **6 Claims**



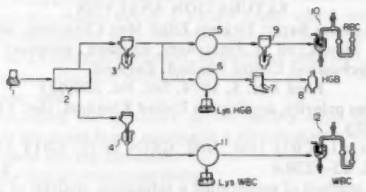
6. A method of detecting carbon monoxide in air, comprising passing a stream of air through a first bed of regenerable air-drying substance and then through porous inactive material, conducting some of the dried air leaving said inactive material to a carbon monoxide detector and the rest through carbon monoxide removing catalytic material offering substantially the same resistance to air flow as said inactive material, conducting the air from said catalytic material through a second bed of regenerable air-drying substance having substantially the same volume and resistance to air flow as the first bed, exhausting the air leaving the second bed to the atmosphere, then reversing the air flow through said beds and material and conducting some of the air leaving said catalytic material to said detector while the rest of the air flows through said inactive material and the first bed to atmosphere, and indicating the amount of carbon monoxide detected by the detector every time the air flow to the detector comes from said inactive material.

4,030,888

AUTOMATIC BLOOD ANALYZER

Hiroshi Yamamoto, Kobe, and Masaaki Oka, Kakogawa, both of Japan, assignors to Toa Medical Electronics Co., Ltd., Kobe, Japan

Filed Feb. 17, 1976, Ser. No. 658,578
Claims priority, application Japan, Feb. 28, 1975, 50-24531
Int. Cl.² G01N *33/16*
U.S. Cl. 23—253 R **4 Claims**



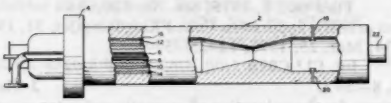
1. In a system of automatic blood analysis for measuring white blood counts, red blood counts, hemoglobin and hematocrit of whole blood incorporating dilution, addition of reagents, agitation, mixing, corpuscular counting and hemoglobin determination, the combination which comprises means for determining white cell counts in a first flow channel and hemoglobin in a second flow channel with single blood dilution, and means for subjecting a portion of a sample in the flow channel for determining hemoglobin to a double blood dilution thereby enabling determination of red cell counts and the hematocrit.

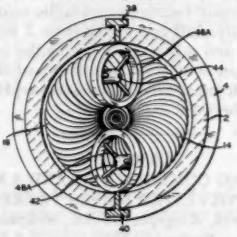
4,030,889

CARBON BLACK REACTOR WITH ADJUSTABLE FLAME LENGTH

Thomas J. Gunnell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 4, 1976, Ser. No. 663,933
Int. Cl.² C01B *49/00*; C10B *47/00*
U.S. Cl. 23—259.5 **11 Claims**





1. A carbon black reactor comprising

a. a housing defined by a wall having an essentially cylindrical interior defining a longitudinal axis,

b. at least one burner located inside of said housing for combusting fuel and oxidant to form hot combustion gases comprising

aa. a fuel discharge nozzle for introducing fuel into said housing,

bb. oxidant feed means for feeding oxidant into said housing essentially parallel to the direction of said fuel discharge and into admixture with said fuel leaving said discharge nozzle,

said burner defining a main discharge axis for the fuel and oxidant, said discharge axis being located at a distance from said longitudinal axis,

c. means attached to said housing for turning said burner essentially in a plane which is essentially parallel to said longitudinal axis and around a pivot axis to adjust the pivot angle which is defined as the angle between the direction of the longitudinal axis of said housing and the main discharge axis of said burner,

d. hydrocarbon feed means attached to said housing for feeding hydrocarbon into said housing and into contact with said hot combustion gases, and

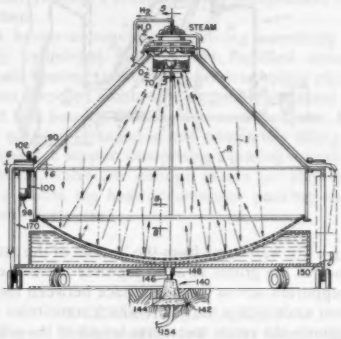
e. withdrawal means attached to said housing for the withdrawal of carbon black-containing smoke from said housing.

4,030,890

SOLAR POWER SYSTEM

Richard E. Diggs, S. 12A Road, P.O. Box 776, Carthage, Mo. 64836

Filed Oct. 20, 1975, Ser. No. 624,409
Int. Cl.² B01D 57/00; B01J 7/00; C01B 13/00; F24J 3/02
U.S. Cl. 23—281 10 Claims



1. Apparatus for separating hydrogen and oxygen from water comprising:

a housing exposed to incident solar energy and having defined therein a chamber for storing water;

means for conducting water into said chamber;

a solar energy reflecting means for reflecting solar energy toward said housing;

first heat transfer means located on said housing to receive said incident solar energy and be heated thereby to form a first source of heat energy, said first heat transfer means being connected to said chamber in a manner such that said heat energy from said first source is transferred to water in said chamber in amounts sufficient to boil same to produce steam;

solar energy reflecting means connected to said first heat transfer means for reflecting part of said incident solar energy to form reflected solar energy;

separating means connected to said housing and connected to said chamber to receive steam therefrom, said separating means having second heat transfer means positioned thereon to receive said incident and said reflected solar energy and be heated thereby to form a second source of heat energy, said second heat transfer means being connected to said separating means and transferring heat from said second source of heat energy to said steam in amounts sufficient to separate said steam into hydrogen and oxygen components;

said separating means including a case connected to said housing having means therein for defining an arcuate path over which said hydrogen and oxygen components pass for creating rotational movement of said hydrogen and oxygen components to separate same by centrifugal forces generated thereon by said rotational movement and

removal means on said housing for removing said separated hydrogen and oxygen components from said separating means.

4,030,891

SINTERED CERMET CONTAINING GROUND MONOCRYSTALS

Vladimir Ilich Alexandrov, ulitsa Ostrovityanova, 31, kv. 281; Vyacheslav Vasilievich Osiko, ulitsa Vavilova, 48, kv. 63, both of Moscow; Ernest Nikolaevich Muraviev, ulitsa Popova, 10, kv. 36, Fryazino Moskovskoi oblasti; Eduard Georgievich Spiridonov, Preobrazhensky val, 24a, kv. 1, Moscow; Vladimir Mikhailovich Tatarintsev, Leninsky prospekt, 45, kv. 112, Moscow, and Vladimir Grigorievich Gordon, 13 Parkovaya, 31, korpus 1, kv. 83, Moscow, all of U.S.S.R.

Filed Dec. 2, 1974, Ser. No. 528,774
Int. Cl.² C22C 1/09
U.S. Cl. 75—234 5 Claims

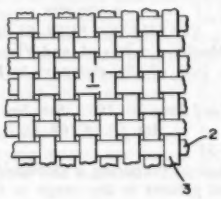
1. A heat-resistant sintered material consisting of a matrix made of a metal-ceramic selected from the group consisting of chromium-aluminium oxide, chromium-chromium oxide and nickel-zirconium carbide and a filler of ground monocrystals with a particle size of from 1 μm to 2 mm of a refractory oxide selected from the group consisting of ruby, zirconia, hafnium dioxide, magnesium oxide, magnesium-aluminium spinel, yttrium oxide, erbium oxide, yttrium aluminium garnet and beryllium oxide.

4,030,892

FLEXIBLE ELECTROMAGNETIC SHIELD COMPRISING INTERLACED GLASSY ALLOY FILAMENTS

Lewis Isaac Mendelsohn, Morristown, and Ethan Allen Nesbitt, Beach Haven, both of N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Mar. 2, 1976, Ser. No. 663,172
Int. Cl.² B21C 37/00; C04B 35/00; H01H 1/00
U.S. Cl. 428—226 11 Claims



1. A flexible electromagnetic shield which comprises interlaced filaments, said filaments comprising at least one metal alloy that is at least 50% glassy, said metal alloy having the composition M_aX_b, where M is at least one element selected from the group consisting of iron and cobalt, X is at least one element selected from the group consisting of boron, carbon and phosphorus, "a" ranges from about 75 to 85 atom percent, "b" ranges from about 15 to 25 atom percent, and a maximum permeability of at least about 50,000 and a coercivity of less than about 0.08 Oe.

4,030,893

METHOD OF PREPARING LOW-SULFUR, LOW-ASH FUEL

Leonard J. Keller, Dallas, Tex., assignor to The Keller Corporation, Dallas, Tex.

Filed May 20, 1976, Ser. No. 688,467
Int. Cl.² C10L 5/00, 9/00; C10G 1/00
U.S. Cl. 44—1 B 17 Claims

1. A method of preparing low-sulfur, low-ash fuel from coal comprising the steps of:

a. comminuting the coal in the presence of an alcohol containing 1–4 carbon atoms, inclusive, to a size wherein a major part of said coal is of −100 mesh size;

b. forming an admixture of the resulting comminuted coal

and said alcohol; said admixture containing at least 40 percent by weight of said coal;

c. separating said admixture into three streams, said streams being a first underflow stream comprising primarily a first slurry of high density solids, a first middling stream comprising primarily a first slurry of said coal particles, and a first overflow of stream comprising primarily said alcohol, a liquor of constituents dissolved from the comminuted coal in said alcohol and colloidal constituents suspended in said alcohol and said liquor;

d. separating said first underflow of said first slurry of high density solids into a second underflow comprising a second viscous slurry of sulfur and solids that would form ash residue if burned with the coal, and a second overflow comprising a dilute slurry of coal in said alcohol and the liquor of constituents dissolved from the comminuted coal in said alcohol;

e. separating said first middling stream into a third underflow comprising a second slurry of high density solids, a second middling stream comprising primarily a second slurry of said coal with only a minor amount of said high density solids and sulfur therein, and a third overflow comprising primarily said alcohol, a liquor comprising constituents dissolved in said alcohol and colloidal constituents suspended in said alcohol and said liquor;

f. separating said first overflow into a fourth underflow and a fourth overflow;

g. refining said fourth overflow into respective desired constituents and said alcohol; and

h. forming a low-sulfur, low-ash fuel from said second middling stream.

4,030,894

STABILIZED FUEL SLURRY

Louis Allen Marlin, Crestwood, and Victor D. Beaucaire, Orland Park, both of Ill., assignors to Interlake, Inc., Oak Brook, Ill.

Filed June 30, 1975, Ser. No. 591,312
Int. Cl.² C10L *1/32*
U.S. Cl. 44—51 **12 Claims**

1. A method of preparing a stabilized fuel slurry having liquid fuel oil present in the range of from about 30% by weight to about 70% by weight, solid fuel particles with diameters as large as about ¼ inch present in the range of from about 25% by weight to about 65% by weight, water present in the range of from about 2% by weight to about 30% by weight and an emulsifier capable of forming a thixotropic water external-oil high internal phase emulsion present in the range of from about 0.2% by weight to about 5% by weight, said method comprising providing a liquid fuel oil adding an emulsifier and solid fuel particles having diameters as large as about 2 inches and water to the liquid fuel oil, and agitating the solid fuel particles with the water, liquid fuel oil and emulsifier to form a thixotropic water external-high internal phase emulsion and to comminute the solid fuel particles in a liquid environment and to form a stabilized fuel slurry having solid fuel particles with diameters as large as about ¼ inch.

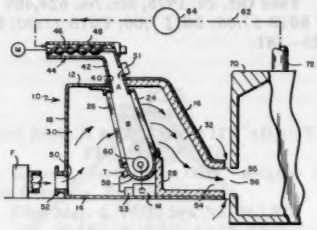
4,030,895

APPARATUS FOR PRODUCING COMBUSTIBLE GASES FROM CARBONACEOUS MATERIALS

Robert A. Caughey, Clinton Road, Antrim, N.H. 03440

Filed Mar. 17, 1976, Ser. No. 667,673
Int. Cl.² C10J *3/00*
U.S. Cl. 48—111 **17 Claims**

1. A reactor for producing combustible gases suitable for delivery to the fire box of a furnace comprising means defining a confining retort, spaced grates, means supporting the grates in said retort so as to slope downwardly from the top at one side to the bottom at the other side, said grates defining a narrow space between them for gravitational movement of a bed of bio-mass material therebetween from the top of the retort to the bottom, said grates dividing the retort into a combining chamber at the upwardly facing sides of the grates and a plenum chamber at the downwardly facing sides of the grates, said combining chamber embodying a refractory lining



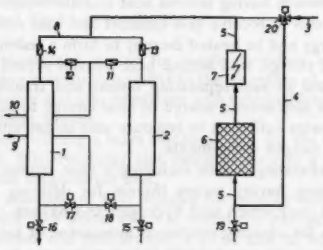
including a fire wall rising from the bottom of the retort to the lower ends of the grates so as to separate the two chambers, means supported across the open space between the grates at their lower ends within the retort which constitutes an ash pit which extends the entire transverse length of the grates below the grates, means for supplying bio-mass material to the space between the grates at the top to form a bed of bio-mass material in the space defined by said grates, and an inlet opening at the bottom of the plenum chamber for supplying primary air thereto.

4,030,896

REGENERATION OF ADSORBENTS

Hans Wimber; Wilhelm Rohde, and Jorg Reyhing, all of Munich, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Apr. 8, 1976, Ser. No. 675,230
Claims priority, application Germany, Apr. 14, 1975, 2516223
Int. Cl.² B01D *53/03*
U.S. Cl. 55—33 **15 Claims**



1. In an adsorption process for the separation of gases wherein gas to be separated is passed through one of several interchangeably connected absorbers, and a main stream of regenerating gas is passed in two sequential periods through

another of said interchangeably connected adsorbers, the first period being an open cycle heating period to desorb the adsorbent, and the second period being an open cycle cooling period to cool the adsorbent to adsorption temperatures said stream of regenerating gas in both of said periods being from a common source,

the improvement which comprises, during said cooling period, branching partial stream of regenerating gas from said main stream, heating said partial stream with heating means, and passing resultant heated partial stream over a heat accumulator, and during said heating period, passing said main stream of regenerating gas across said heat accumulator to recover heat stored in said accumulator during the cooling period, and further heating said main stream with said heating means to heating period regeneration temperature, said heating means comprising a heater yielding a source of heat independent of said adsorbers.

15. A heater-accumulator consisting essentially of a substantially cylindrical housing and disposed concentrically within said housing, a thermally insulated pipe, electric heating means disposed within said thermally insulated pipe, said pipe and said housing defining a concentric space; heat accumulator packing arranged in and completely filling said concentric space, a support comprising a grating for said packing, and switching valve and conduit means for allowing flow in sequence across the heat accumulator packing and heating means and vice versa.

4,030,897
DEGASSING OF LIQUIDS

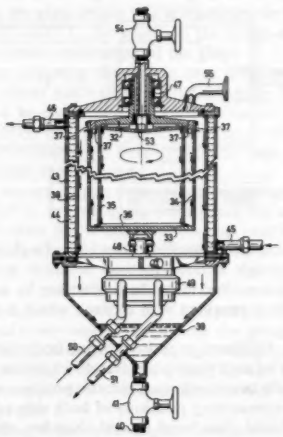
Rudolf Pelzer, Herzogenrath, and Heinz Scholl, Eschweiler, both of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 25, 1975, Ser. No. 635,374

Claims priority, application France, Nov. 28, 1974, 74.38961

Int. Cl.² B01D *19/00*

U.S. Cl. 55—42 **8 Claims**



1. A method of degassing viscous liquids comprising the steps of

feeding the liquid to be degassed through a duct to the interior of a centrifuge vessel located within an enclosure in which the gas pressure is reduced,

simultaneously rotating said vessel about an axis passing through said duct,

directing the flow of liquid from said duct in a direction substantially perpendicular to the direction of flow from said duct by means of a distributor plate within said vessel transverse to said axis of rotation,

continuing the flow of liquid in a zig-zag path from the inside to the outside of said vessel over inner surfaces of a plurality of coaxial annuli and removing gas from said annuli and enclosure,

and discharging the liquid from said enclosure.

4,030,898
QUICK FREEZING APPARATUS

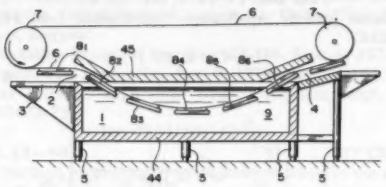
Masahiro Morita, 4-15, 3-chome, Nishigahara, Kita, Tokyo, Japan

Filed Nov. 19, 1975, Ser. No. 633,401

Claims priority, application Japan, Nov. 27, 1974, 49-135551

Int. Cl.² A23G *9/00*; **F25D** *17/02*

U.S. Cl. 62—345 **13 Claims**



1. An apparatus for quick freezing articles, comprising a tank charged with a freezing medium which is liquid at the normal temperature and in a low temperature range under atmospheric pressure; continuous conveying means for containing the articles to be frozen, said conveying means being made of a thin, flexible material having a high temperature conductivity; guiding means for guiding and dipping said conveying means into the medium in said tank, so that liquid pressure in said medium causes said conveying means to come in intimate contact with the article to be frozen contained therein, the temperature of said medium being immediately transmitted to said article; driving means for continuously moving said conveying means; and means for continuously circulating and cooling said medium at least above said conveying means.

4,030,899
COOLING DEVICE

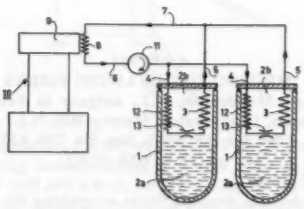
Joannes Wilhelmus Van Litsenburg, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,329

Claims priority, application Netherlands, Feb. 24, 1975, 7502146

Int. Cl.² F25B *19/00*

U.S. Cl. 62—514 R **4 Claims**



1. A cooling device for maintaining a low operating temperature in an enclosure, comprising boundary means defining said enclosure and containing a liquefied gas, said enclosure having an inlet duct conveying a flow of cooled medium to said enclosure, and an outlet duct for conveying said cooled

medium from said enclosure, said ducts passing through at least one boundary wall defining said enclosure, the path between said inlet duct and said outlet duct including the serial connection of a heat exchanger, a restriction means and a cooling element, said restriction means being situated between said heat exchanger and said cooling element, said heat exchanger being coupled in good heat exchanging contact in said enclosure.

4,030,900

COOLING DEVICE

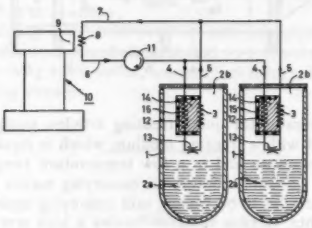
Joannes Wilhelmus Van Litsenburg, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,347

Claims priority, application Netherlands, Feb. 24, 1975, 7502147

Int. Cl.² F25B *19/00*

U.S. Cl. 62—514 R **6 Claims**



1. A cooling device for maintaining a low operating temperature in an enclosure, comprising, boundary means defining said enclosure and containing a liquified gas, said enclosure having an inlet duct conveying a flow of cooled medium to said enclosure, and an outlet duct for conveying said cooled medium from said enclosure, said ducts passing through at least one boundary wall defining said enclosure, the path between said inlet duct and said outlet duct including the serial connection of a heat exchanger, a restriction means and a cooling element, said restriction means being situated between said heat exchanger and said cooling element, means positioning said heat exchanger in said enclosure in heat exchanging contact with said cooling element, and means for heat insulating said heat exchanger from said enclosure.

4,030,901

METHOD FOR DRAWING FIBERS

Peter Kaiser, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 19, 1976, Ser. No. 706,927

Int. Cl.² C03B *37/02*

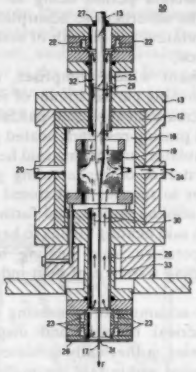
U.S. Cl. 65—2 **1 Claim**

1. A method for drawing fibers comprising the steps:

heating a preform in a furnace so that the preform begins to flow forming a fiber,

pulling the fiber from the furnace, and

flushing the preform, the fiber and a heater within a chamber located in the furnace with counteracting inert gas flows, by injecting the gas from ports located at opposite ends of the furnace into the chamber and exhausting the gas from the chamber through a port located near the heater within the chamber, the gas flows protecting the preform and the fiber from contamination.



4,030,902

FLOAT GLASS BAND WIDTH CONTROL METHOD

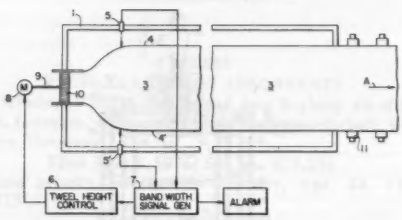
Yasuyuki Nagae, Sakai, Japan, assignor to Central Glass Co., Ltd., Ube, Japan

Continuation of Ser. No. 523,545, Nov. 13, 1974, abandoned. This application Apr. 1, 1976, Ser. No. 672,560

Claims priority, application Japan, Nov. 14, 1974, 49-127187

Int. Cl.² C03B *18/02*

U.S. Cl. 65—29 **4 Claims**



1. A method for controlling the width of a glass band manufactured through a float method wherein melted glass is charged into a melted metal bath chamber by way of an inlet of the chamber provided with a tweel, which is characterized by:

detecting visible rays emitted from both side edges of a portion of said glass band in said chamber so as to produce only two continuous electric position signals respectively representing positions of both side edges of a portion of said glass band in said chamber, the visible rays being detected as images by a single pair of image pick-up tubes which are respectively diametrically disposed on the both side walls of the chamber above the metal bath;

said image pick-up tubes being aimed in a direction to receive an image of the respective side edges; converting said two continuous electric position signals into a width signal representing the width of said glass band; and

continuously regulating the position of said tweel in accordance with said width signal so as to maintain substantially constant the width of said glass band.

4,030,903
EXUDED TRANSITION METAL FILMS ON GLASS-CERAMIC ARTICLES

Hermann L. Rittler, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 431,148, Jan. 1, 1974, Pat. No. 3,962,514. This application Dec. 24, 1975, Ser. No. 644,130

Int. Cl.² C03B *32/00*; **C03C** *15/00, 17/00, 3/22*

U.S. Cl. 65—32 **8 Claims**

1. A method of providing a glass-ceramic article having an exuded surface film comprising at least one transition metal compound selected from the group consisting of Mn_3O_4, Fe_3O_4, Co_3O_4, $NiAl_2O_4$, $CoAl_2O_4$, $FeAl_2O_4$, $ValO_4$, $NiFe_2O_4$, $CoFe_2O_4$, $MnFe_2O_4$, $MnTiO_3$, $CoTiO_3$, $FeTiO_3$, $Co_2TiO_4$and $CoMn_2O_4$ on at least a portion of the surface thereof which comprises the steps of:

a. compounding a batch for a glass composition consisting essentially, in weight percent on the oxide basis as calculated from the batch, of about 55–80% SiO_2, 14–35% Al_2O_3, 0–5% Li_2O, 0–7% TiO_2, 0–10% ZrO_2, 3–13% total of said $TiO_2 + ZrO_2$, 0–3% F, and 0.1–10% total of transition metal oxide additives containing one or more of the transition metals manganese, iron, cobalt, chromium, nickel and vanadium in a combination which will provide one or more of said Mn_3O_4, Fe_3O_4, Co_3O_4, $NiAl_2O_4$, $CoAl_2O_4$, $MnAl_2O_4$, $FeAl_2O_4$, $ValO_4$, $NiFe_2O_4$, $CoFe_2O_4$, $MnFe_2O_4$, $MnTiO_3$, $CoTiO_3$, $FeTiO_3$, Co_2TiO_4 and $CoMn_2O_4$ transition metal compounds on the surface of said article, said additives being selected in the indicated proportions from the group consisting of 0–5% MnO_2, 0–5% Fe_2O_3, 0–3% CoO, 0–2% Cr_2O_3, 0–3% V_2O_5 and 0–10% NiO, the foregoing constituents comprising at least about 90% by weight of said composition and said composition being capable of forming a principle crystal phase selected from the group consisting of beta-spodumene and beta-quartz solid solutions upon thermal crystallization thereof;

b. melting said batch at a temperature in the range of about 1600°–1650° C. for a time in the range of about 6–16 hours to provide a molten glass;

c. forming the molten glass into a glass article;

d. exposing the glass article to a temperature in the range of about 700°–800° C. for a time in the range of about 1–4 hours to obtain nucleation of the glass;

e. thereafter exposing the article to a temperature in the range of about 800°–1200° C. for a time in the range of about 1–8 hours to obtain crystallization of the glass by the formation of a principal crystal phase selected from the group consisting of beta-quartz and beta-spodumene solid solution therein; and

f. exposing the article to a temperature in the range of about 500°–1000° C. in a reducing atmosphere for a time in the range of about ½–10 hours to develop said exuded surface film comprising said transition metal compounds thereon.

5. A method of providing a glass-ceramic article having an exuded ferromagnetic surface film comprising at least one transition metal compound selected from the group consisting of Mn_3O_4, Fe_3O_4, $MnAl_2O_4$, $NiAl_2O_4$, $NiFe_2O_4$, $MnFe_2O_4$, $MnCr_2O_4$, $MnNb_2O_6$, $NiNb_2O_6$, $Ti_2Nb_{10}O_{29}$, and $Mn_2Al_2(SiO_4)_2$ on at least a portion of the surface thereof which comprises the steps of:

a. compounding a batch for a glass composition consisting essentially, in weight percent on the oxide basis as calculated from the batch, of about 10–60% MnO_2, at least one oxide selected in the indicated proportion from the group consisting of 10–70% SiO_2, 13–43% Al_2O_3, and 0–35% B_2O_3, essentially including at least about 5% B_2O_3 and 20% Al_2O_3 when SiO_2 is absent, not exceeding about 5% B_2O_3 when Al_2O_3 is absent, and not exceeding about 10% B_2O_3 when both SiO_2 and Al_2O_3 are present, at least about 60% total of $MnO_2 + SiO_2 + Al_2O_3 + B_2O_3$, 0–30% Nb_2O_5, 0–35% La_2O_3, 0–10% Ta_2O_5, 0–15% BaO, 0–10% SnO_2, 0–4% ZnO, 0–10% ZrO_2, 0–20% TiO_2, 0–5% Fe_2O_3, 0–10% NiO, 0–3% Cr_2O_3, 0–3% CoO and 0–10% K_2O;

b. melting the batch at a temperature in the range of about 1500°–1600° C. for a time in the range of about 6–16 hours;

c. forming the molten glass into a glass article;

d. exposing the glass to a temperature in the range of about 600°–1200° C. for a time in the range of about 4–24 hours to obtain crystallization of the glass; and

e. exposing the crystallized glass to a temperature in the range of about 500°–1000° C. in a reducing atmosphere for a time in the range of about 178 –10 hours to develop said exuded surface film comprising said transition metal compounds therein.

4,030,904
SURFACE COATING OF GLASS CONTAINERS WHILE ANNEALING

Christopher John Battye, St. Albans, and Roger John Dorey, Harpenden, both of England, assignors to United Glass, Ltd., Staines, England

Continuation-in-part of Ser. No. 503,786, Sept. 6, 1974, abandoned. This application Aug. 8, 1975, Ser. No. 603,014

Claims priority, application United Kingdom, Sept. 10, 1973, 42473/73

Int. Cl.² C03C *17/28*

U.S. Cl. 65—60 A **17 Claims**

1. A method of treating glass containers wherein the containers, after forming and before annealing, are subjected to the action of a material which forms a metal oxide coating on the surface thereof and to the spray application of a spray reagent comprising a solution, emulsion or suspension of a polymeric material resistant to oxidation and thermal degradation when maintained at a temperature of 550° C for a period of several minutues, said polymeric material being polyphenylene sulfide, polyphenylene oxide, a polyimide, a polyimide-amide or polybenzoxazole, a polyphenylquinoxaline, a polybenzamidazole, poly-bis-benzimidazo-benzophenanthroline, a polyimidazopyrrole, a Diels-Alder polyphenylene, a polybenzothiazole, a poly(alkyl-aryl ether), a carborane-siloxane, a cyclodisilazane or poly(p-oxybenzoyl), whereafter the containers are annealed.

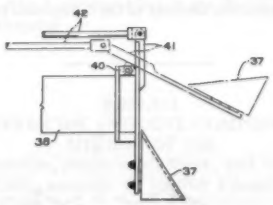
4,030,905
GROOVING GLASS BATCH

Charles T. Hawkins, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 30, 1975, Ser. No. 627,163

Int. Cl.² C03B *3/00*

U.S. Cl. 65—135 **10 Claims**



1. In an apparatus for the manufacture of glass comprising a glass melting furnace having a bottom, side walls, a front wall, a back wall and a roof; further having, in the vicinity of said back wall, means for charging glass batch materials into said furnace; further having, in the vicinity of said front wall, means for discharging molten glass from said furnace; and further having overhead means for supplying heat to at least a portion of said furnace for melting glass batch materials forming molten glass therefrom; wherein a portion of said furnace is for moving glass batch materials as a layer of batch floating

on molten glass along a longitudinal axis of the furnace in a general direction away from said back wall and toward said front wall while melting said floating glass batch materials; the improvement comprising

a support arm extending into said furnace at least partially transversely to the longitudinal axis of said furnace;

a blade mounted on said arm for vertical movement with respect to said support arm from an upper position above said batch materials entering said furnace to a lower position in contact with said batch materials; and

means for reciprocally moving said support and transversely to the longitudinal axis of said furnace, whereby said blade may be moved through said batch materials when said blade is positioned therein.

7. In the making of glass wherein glass batch materials are charged to a glass melting furnace having a bottom, side walls, a front wall, a back wall and a roof and wherein said charged glass batch materials are caused to move away from said back wall toward said front wall between said side walls by floating as a layer on molten glass and wherein heat is supplied from above to said glass batch materials to melt them, forming molten glass, and wherein molten glass is discharged from said furnace in the vicinity of said front wall and formed into useful articles; the improvement comprising

moving a blade substantially horizontally through the floating glass batch materials along a path substantially transverse to the movement of the glass batch materials through the furnace, and

repeating said blade moving step after a sufficient time interval to provide for the making of spaced depressions in the floating layer of glass batch materials which depressions are of an initial depth above that which would expose molten glass upon which the glass batch materials float.

4,030,906

HERBICIDAL N-HALOACETYL-1,2-DIHYDRO-4H-3,1-BENZOXAZINE

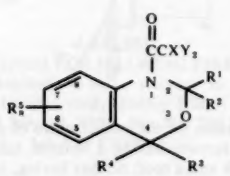
John W. Kobzina, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 509,979, Sept. 27, 1974, Pat. No. 3,917,592. This application Oct. 20, 1975, Ser. No. 623,842

Int. Cl.² A01N 9/22

U.S. Cl. 71—66 **17 Claims**

1. A method for controlling undesirable vegetation which comprises applying to the vegetation or the locus thereof a herbicidally effective amount of the compound of the formula



wherein X is fluoro, chloro or bromo, Y is hydrogen, fluoro, chloro, or bromo, R^1 is hydrogen or alkyl of 1 to 6 carbon atoms, R^2 is hydrogen or alkyl of 1 to 6 carbon atoms, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, R^4 is hydrogen or alkyl of 1 to 6 carbon atoms, R^5 is chloro, bromo or alkyl of 1 to 6 carbon atoms, and *n* is 0, 1 or 2.

4,030,907

COPPER ALGAECIDE OF INCREASED STABILITY AND METHOD OF PRODUCING THE SAME

Lester Ray McNall, Fullerton, Calif., assignor to Thompson-Hayward Chemical Co., Kansas City, Kans.

Filed June 12, 1974, Ser. No. 478,827

Int. Cl.² A01N 11/04

U.S. Cl. 71—67 **19 Claims**

1. A concentrated aqueous algaecide composition having an improved stability against photodecomposition, said composition consisting essentially of an aqueous solution of at least 50% by weight of a complex formed by reacting about 1 part of a water soluble copper salt and about 1 to 2 parts of an alkanolamine having at least one alkanol group of 1 to 10 carbon atoms and at least 0.5% based on the weight of the complex of a water-soluble ionizable ammonium compound and having a pH greater than 7.

2. The algaecide composition of claim 1 wherein the ammonium compound is selected from the group consisting of diammonium citrate, diammonium phosphate and ammonium nitrate.

4,030,908

N-[3-(4-METHYL-3-CYCLOHEXENYL)BUTYL]AMINES AND THEIR USE AS PLANT GROWTH REGULATORS

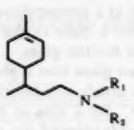
Jerry G. Strong, Fanwood, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 221,384, Jan. 27, 1972, Pat. No. 3,890,384. This application Feb. 27, 1975, Ser. No. 553,771

Int. Cl.² A01N 5/00

U.S. Cl. 71—78 **6 Claims**

1. A method for regulating growth of tobacco plants by inhibiting terminal and secondary bud growth and controlling the axillary growth known as suckers comprising contacting said plant with an amount effective to attain such regulation and control of a compound having the general formula:



wherein R_1 and R_2 are each selected from the group consisting of hydrogen and alkyl (C_1-C_8).

4,030,909

HERBICIDAL COMPOSITIONS

Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, heiress-at-law), assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 22, 1975, Ser. No. 624,941

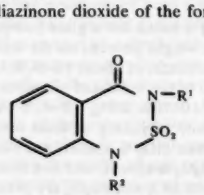
Claims priority, application Germany, Nov. 14, 1974, 2453908

Int. Cl.² A01N 9/12

U.S. Cl. 71—91 **9 Claims**

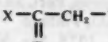
1. A herbicidal composition consisting essentially of an inert carrier having dispersed therein a herbicidally effective amount of a mixture of

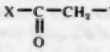
a. a benzothiadiazinone dioxide of the formula



where R^1 denotes alkyl of a maximum of 4 carbon atoms and R^2 denotes hydrogen, an alkali metal ion, a diloweralkylammonium ion or a dilowerhydroxyalkylammonium ion, and

b. a glycolic acid amide of the formula

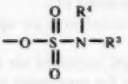




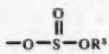
where X denotes

R^1 denoting alkyl, alkenyl, alkynyl or alkoxyalkyl of a maximum of 4 carbon atoms and R^2 denoting unsubstituted phenyl, phenyl monosubstituted or disubstituted by methyl or ethyl, or X denotes a mono- or bicyclic radical of the formula

n denoting one of the integers 4, 5, 6, 7 and 8, and Y denotes



R^3 denoting hydrogen or alkyl of a maximum of 4 carbon atoms and R^4 denoting alkyl of a maximum of 4 carbon atoms or



R^5 denoting alkyl of a maximum of 4 carbon atoms or methylsulfonyl, and compound a and compound b are in a weight ratio of 1:4 to 4:1.

4,030,910

SUBSTITUTED PYRIDINYLOXY(THIO)PHENYL -ACETAMIDES, -UREAS AND UREA DERIVATIVES, HERBICIDAL COMPOSITIONS AND METHODS CONTAINING SAME

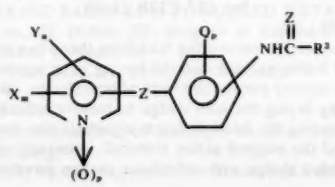
Howard Johnston, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 435,615, Jan. 22, 1974, Pat. No. 3,931,201. This application Oct. 16, 1975, Ser. No. 623,158

Int. Cl.² A01N *9/22, 9/12;* **C07D** *213/62, 213/89*

U.S. Cl. 71—94 **33 Claims**

1. A compound corresponding to the formula:



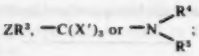
wherein:

each *p* independently represents an integer of 0 or 1;

each X independently represents bromo, chloro, iodo or fluoro;

m represents an integer of 0 to 4, inclusive;

each Y independently represents nitro, ZR^3,



n represents an integer of 0 to 2, inclusive;

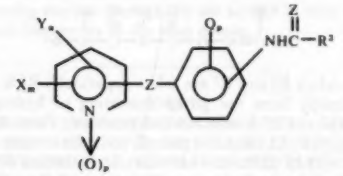
each Z independently represents oxygen or sulfur;

Q represents methyl, ethyl, halo, nitro or trifluoromethyl;

each X′ independently represents hydrogen or halo;

R^3 represents alkyl of from 1 to 3 carbon atoms; and R^4 and R^5 each independently represent hydrogen or alkyl of from 1 to 4 carbon atoms.

25. The method of selectively controlling undesired plant growth in the presence of desired crop plants which comprises applying to plants and/or their habitats a herbicidally-effective amount of a compound of the formula:



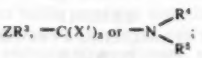
wherein:

each *p* independently represents an integer of 0 or 1;

each X independently represents bromo, chloro, iodo or fluoro;

m represents an integer of 0 to 4, inclusive;

each Y independently represents nitro, ZR^3,



n represents an integer of 0 to 2, inclusive;

each Z independently represents oxygen or sulfur;

Q represents methyl, ethyl, halo, nitro or trifluoromethyl;

each X′ independently represents hydrogen or halo;

R^3 represents alkyl of from 1 to 3 carbon atoms; and

R^4 and R^5 each independently represent hydrogen or alkyl of from 1 to 4 carbon atoms in the presence of an inert carrier therefor.

4,030,911

SULFIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHOD OF USE

Duane R. Arneklev, Plentywood, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 394,230, Sept. 4, 1973, abandoned. This application June 27, 1975, Ser. No. 591,239

Int. Cl.² A01N *9/12*

U.S. Cl. 71—98 **7 Claims**

1. The method of protecting a crop from injury due to a thiocarbamate herbicide, comprising applying to the habitat prior to planting from about 0.01 to about 15 parts by weight for each part by weight of the thiocarbamate herbicide an antidote compound corresponding to the formula

wherein R_1 is selected from the group consisting of, chloroalkyl, having from 1 to 4 carbon atoms, inclusive, hydroxyethyl, carboxymethyl, β-S-ethylthiocarboxylaminoethyl and dichloroacetamidoethyl; and R_2 is selected from the group consisting of alkyl, having from 1 to 8 carbon atoms, inclusive, chloroalkyl, having from 1 to 4 carbon atoms, inclusive, cyanoalkyl, having at least one cyano group and an alkyl moiety having from 1 to 4 carbon atoms, inclusive, β-S-ethylthiocarboxylaminoethyl and dichloroacetamidoethyl.

4,030,912

CERTAIN OXIMINYL ALLOPHANATES AND THEIR USE AS HERBICIDES

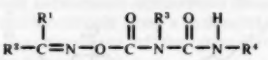
Peter Anthony Bukowick, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 350,128, April 11, 1973, Pat. No. 3,957,867. This application Oct. 28, 1975, Ser. No. 626,524

Int. Cl.² A01N 9/20

U.S. Cl. 71—120 **9 Claims**

1. A herbicidal composition comprising (1) application aid material and (2) an effective quantity of phytotoxic material comprising a compound of the formula:



in which when R^1 and R^2 are taken separately, R^1 is selected independently from the group consisting of hydrogen and C_1-C_7 alkyl and R^2 is selected independently from the group consisting of C_1-C_7 alkyl and phenyl, and, when taken together with the carbon atom to which they are attached R^1 and R^2 form a C_3-C_8 cycloalkyl group; R^3 is selected from the group consisting of C_1-C_7 alky, allyl, phenyl, 3-halophenyl and 3,4-dihalophenyl; and R^4 is selected from the group consisting of C_1-C_7 alkyl; allyl, cyclohexyl, phenyl, halophenyl, tolyl, anisolyl, nitrophenyl, 3,4-dihalophenyl, 1-naphthyl, p-toluene sulfonyl, trihalomethylphenyl and 2,6-dinitro-4-trihalomethylphenyl.

4,030,913

METHOD OF STABILIZING PYROPHOROUS IRON POWDER

Joachim Wegener, Aachen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,079

Claims priority, application Germany, June 3, 1975, 2524517

Int. Cl.² C23F 9/02, 11/14

U.S. Cl. 75—.5 R **8 Claims**

1. A method of stabilizing pyrophorous iron powder in a liquid medium, characterized in that the powders are contacted with organic compounds which contain oxygen bound to nitrogen.

4,030,914

METHOD OF TREATING ALUMINUM DROSSES, SKIMS AND SLAGS

Pandelis N. Papafingos, and Richard T. Lance, both of Riverside, Calif., assignors to Alumax Mill Products, Inc., Riverside, Calif.

Filed Apr. 12, 1976, Ser. No. 676,170

Int. Cl.² C22B 21/00

U.S. Cl. 75—68 R **2 Claims**

1. In a process for recovering aluminum from drosses, in which aluminum drosses are melted under a cover flux for the separation of aluminum metal values from the dross, the improvement wherein the metal flux consists essentially of potassium chloride and calcium chloride, with a calcium chloride content of from about 3 to about 20%.

4,030,915

PROCESS FOR PRODUCING RAW COPPER CONTINUOUSLY IN ONE STAGE FROM UNREFINED SULFIDIC COPPER CONCENTRATE OR ORE

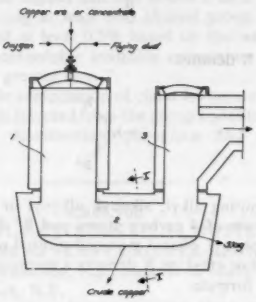
Olavi August Aaltonen, Pori; Bengt Torsten Andersson, Espoo; Jyrki Tapani Juusela, Pori; Matti Johannes Palperi, Imatra, and Tapio Kalevi Tuominen, Pori, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Aug. 21, 1975, Ser. No. 606,532

Claims priority, application Finland, Nov. 11, 1974, 743266

Int. Cl.² C22B 15/00

U.S. Cl. 75—74 **1 Claim**



1. A process for producing clean raw copper continuously in one stage from at least one raw material low in iron selected from the group consisting of sulfides, copper concentrates and ores containing as impurities at least one element selected from the group consisting of lead, antimony, bismuth and arsenic comprising the steps of:

feeding the raw material into an upper part of a reaction zone, while

feeding air or oxygen enriched air into said upper part of said reaction zone for producing a suspension of said raw material in said reaction zone, and

controlling the amount of oxygen fed into said reaction zone for controlled oxidation of said raw material to produce a melt containing essentially only raw copper and slag below said reaction zone, and so that said raw copper in equilibrium with the slag contains less than 0.5% by weight of sulfur and 0.2–1.5% by weight of oxygen,

feeding said suspension downwards at a temperature of 1300°–1700° C, through said reaction zone,

causing said suspension to impinge against the melt below said reaction zone, guiding aside any gases and flying dusts associated with said suspension, and

separating and removing said slag at a temperature of 1250°–1450° C and said raw copper at a temperature of 1150°–1350° C.

4,030,916

PROCESS FOR RECOVERING LEAD FROM THE ACTIVE MATERIAL OF USED BATTERIES

Max Liniger, Basel, Switzerland, assignor to Andreas M. Liniger, Basel, Switzerland

Filed Jan. 6, 1976, Ser. No. 646,767

Claims priority, application Switzerland, Jan. 8, 1975, 153/75

Int. Cl.² C22B 13/00

U.S. Cl. 75—77 **7 Claims**

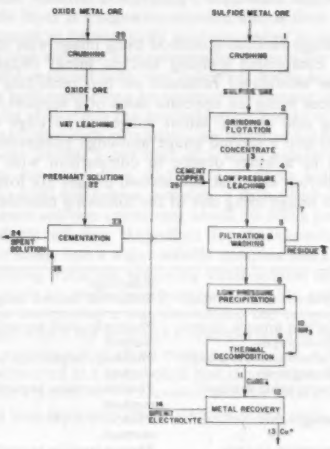
1. A process for recovering lead from the active material of used lead batteries, said material having been separated from the other battery parts in the form of lead sludge, said process comprising drying the lead sludge to remove substantially all water; grinding the dried sludge to a particle size approximating that of the original active material; intimately mixing the ground dried sludge with anhydrous carbon powder; heating

the resulting mixture in a closed furnace to decompose and reduce the lead compounds in the sludge to metallic lead, the carbon powder being oxidized; filtering and compressing the gaseous reaction products produced by the heating step; cooling said compressed gaseous reaction products to liquefy the SO_2 content thereof; and removing said liquefied SO_2 from the remaining gaseous reaction products.

4,030,917
HYDROMETALLURGICAL PROCESSING OF METAL SULFIDES

Anthony G. Fonseca, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Nov. 12, 1975, Ser. No. 631,015
Int. Cl.² C22B *15/10*
U.S. Cl. 75—103 **5 Claims**



1. A method for recovery of both sulfur and metal values from copper sulfide ores comprising (a) adding a non-sulfide metal containing material to balance the sulfide/recoverable metal mole ratio in the ore to at least 1 to 1, while (b) leaching the metal sulfides at pH of at least 7 in the presence of NH_3 and O_2, and (c) recovering all sulfur and metal values from the leach solutions.

4,030,918
INDIUM CONTAINING DENTAL ALLOY POWDER

Pei Sung, Lawrenceville, and Frederic James Schweder, Trenton, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed May 27, 1976, Ser. No. 690,496
Int. Cl.² C22C *30/00*
U.S. Cl. 75—134 B **14 Claims**

1. An amalgamatable dental alloy comprising particles with each particle being a homogeneous mixture of 35 to 50 percent silver, 20 to 30 percent copper, 25 to 35 percent tin and 2 to 8 percent indium.

4,030,919
CONTINUOUS METHOD OF AND APPARATUS FOR MAKING BARS FROM POWDERED METAL

Paul M. Lea, III, Dolton, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Mar. 21, 1975, Ser. No. 560,577
Int. Cl.² B22F *3/16, 3/20*
U.S. Cl. 75—214 **5 Claims**

1. A continuous method of forming a bar from a powdered metal comprising,

successively introducing outwardly of one end a quantity of powdered metal into an open ended and horizontally disposed die cavity of fixed diameter, applying a horizontally disposed reciprocating compacting means movable between a retraction position outside of said die and a compaction position within said die to compact each quantity of powdered metal into bonded segments of a bar of which at least a length of the bar frictionally engages the walls of the die cavity and serves as a stop means against which subsequent quantities of powdered metal are compacted and bonded to form further segments of the bar,

measuring the frictional resisting force of the length of the bar in the cavity relative to a predetermined resisting force at which a subsequent quantity of powdered metal is compacted into a segment of predetermined physical characteristics,

controlling the travel of the compacting means by varying the retraction position of said compacting means while maintaining the compaction position thereof constant so that the quantity of powdered metal introduced in the die cavity to achieve a compaction compensates for deviations of the measured force from the predetermined resisting force and the successive quantity of powdered metal is bonded to the bar as a segment having the desired physical characteristics,

and forcing the bar through the die so that at least a length of said bar serves as the stop means.

4,030,920
PROCESSING COMPOSITIONS CONTAINING GLYCOLS FOR COLOR TRANSFER PROCESSES COMPRISING DIRECT POSITIVE SILVER HALIDE DEVELOPEMENT

Arthur David Kuh, Penfield, and Paul Brainard Condit, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1976, Ser. No. 675,660
Int. Cl.² G03C *7/00, 5/54, 1/40, 5/24*
U.S. Cl. 96—29 D **23 Claims**

20. In a process for producing a photographic transfer image in color from an imagewise-exposed photosensitive element comprising a support having thereon at least one photosensitive internal-image silver halide emulsion layer having associated therewith a ballasted redox dye releaser; said process comprising treating said photosensitive element with an alkaline processing composition in the presence of a silver halide developing agent and a fogging agent to effect development of each of said exposed silver halide emulsion layers, whereby an imagewise distribution of dye is formed as a function of development and at least a portion of it diffuses to a dye image-receiving layer to provide said transfer image, the improvement comprising including in said alkaline processing composition a compound which is a saturated aliphatic or alicyclic glycol having from 3 to 10 carbon atoms or a saturated, aliphatic or alicyclic amino alcohol having from 2 to 10 carbon atoms.

4,030,921
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Kato Akira; Itoh Akira; Uchida Tohru, all of Hachioji, and Ishihara Masao, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Hachioji, Japan

Filed Nov. 10, 1975, Ser. No. 630,413
Claims priority, application Japan, Nov. 19, 1974, 49-133262
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1.5 **4 Claims**

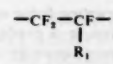
1. A photosensitive article for electrophotography having a conductive substrate and a photosensitive coating of a dried solution or dispersion comprising a photoconductive material, a binder and a fluorine-containing compound characterized

by a plurality of units represented by the following structural formula:

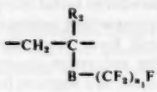
$$-[X]_m-[Y]_n-$$

wherein:

X is a fluorine-containing monomeric unit selected from the group consisting of:


a)

wherein R_1 is F, Cl or CF_3; and


b)

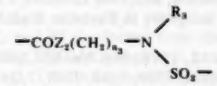
wherein:

R_2 is H or CH_3,

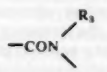
B is

i. $-COZ_1(CH_2)_{n_2}$ - where Z_1 is —O— or —NH— and n_2 is an integer of 1 - 4,

ii. —OOC—;


(iii)

where Z_2 is —O— or —NH—, n_3 is an integer of 1 - 4 and R_3 is an alkyl group having 1 - 4 carbon atoms; or


(iv)

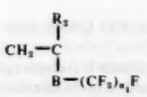
where R_3 is an alkyl having 1 - 4 carbon atoms, and n_1 is an integer of 1 - 18;

and Y represents a monomer copolymerizable with X; with the proviso that when

X is

then m_1/m_1+m_2 is 0.95 - 0.1 and when

X is



then m_1/m_1+m_2 is 1.0 - 0.1

4,030,922

IMAGE RECORDING METHOD

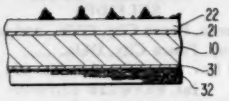
Satoru Honjo, and Seiji Matsumoto, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 26, 1975, Ser. No. 617,130

Claims priority, application Japan, Sept. 26, 1974, 49-109987

Int. Cl.² G03G *13/22*

U.S. Cl. 96—1 R **14 Claims**



1. An image recording method using image-wise modulated radiation comprising forming electric latent images of the image-wise modulated radiation on two recording surfaces, said surfaces being on opposite sides of a support; and then converting said electric latent images to an edge enhanced first image and a second image non-edge enhanced, or edge enhanced to a lesser degree in comparison with said first image, wherein said first and second images are formed from said latent image using one of the following combinations (i) - (ix):

	Edge Enhanced First Image	Non-edge Enhanced Second Image
(i)	Carlson process electrophotography	Photomigration recording method
(ii)	Carlson process electrophotography	Photoelectrophoretic recording method
(iii)	Ionographic method	Photomigration recording method
(iv)	Ionographic method	Photoelectrophoretic recording method
(v)	Inversion electric field electrophotography	Photomigration recording method
(vi)	Inversion electric field electrophotography	Photoelectrophoretic recording method
(vii)	Carlson process electrophotography	Carlson process electrophotography
(viii)	Carlson process electrophotography	Combination of ionography and Photomigration recording method
(ix)	Ionographic method	Ionographic method

4,030,923

MIXTURE OF BINDER MATERIALS FOR USE IN CONNECTION WITH A CHARGE TRANSPORT LAYER IN A PHOTOCONDUCTOR

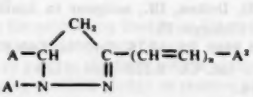
Donald Lester Krause, Boulder, and Kenneth Dale Presley, Loveland, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,795

Int. Cl.² G03G *5/04*

U.S. Cl. 96—1.5 **12 Claims**

1. An improved layered electrophotoconductive imaging element containing a conductive substrate, a charge generating layer and a charge transport layer, said charge transport layer comprising a tri-aryl pyrazoline compound having the formula:



wherein n is zero or one, and A, A^1 and A^2 are each aryl radicals, the improvement comprising:

said charge transport layer including said triaryl pyrazoline compound and a mixture of binder materials comprising about 10 to 25% by weight acrylic resin and about 75 to 90% by weight polycarbonate.

4,030,924

METHOD OF PRODUCING PHOTOGRAPHIC IMAGES

Emiel Alexander Hofman, Mortsel, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 429,631, Dec. 28, 1973, abandoned. This application Oct. 29, 1975, Ser. No. 626,766

Claims priority, application United Kingdom, Oct. 11, 1967, 46444/67

Int. Cl.² G03C *5/26, 5/38, 1/06, 1/48*

U.S. Cl. 96—61 R **8 Claims**

1. A process of forming a photographic image, wherein a photographic material comprising a supported light-sensitive silver halide layer is imagewise exposed and is then continuously advanced at substantially constant speed in successive order into and through four processing stations for treating said exposed material with the following baths in order: a developing bath comprising an aqueous developing or activating liquid for converting the exposed silver halide to metallic silver, a stabilizing bath comprising an aqueous solution containing about 20-300 g per liter of a water-soluble alkaline thiocyanate for converting undeveloped silver halide to a substantially light-insensitive complex, a fixing bath comprising an aqueous solution containing about 50-300 g per liter of a water-soluble alkaline thiosulfate for transforming unexposed silver halide into a water-soluble complex and a washing bath comprising water for removing water-soluble silver salts from said layer to produce a permanent quality print, each such station comprising a tray containing the corresponding bath through which the material is transported and each such bath being maintained at about room temperature, said material being advanced at a speed such that it is immersed in each such bath for a period of 1-15 seconds and the total processing time for all four such processing stations is not more than 60 seconds.

4,030,925

PHOTOGRAPHIC COMPOSITIONS AND ELEMENTS INCLUDING INTERNAL LATENT IMAGE SILVER HALIDE GRAINS AND ACYLHYDRAZINOPHENYLTHIOUREA NUCLEATING AGENTS THEREFOR

Ronald E. Leone; Wayne W. Weber, II, and Donald P. Wrathall, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 601,891, Aug. 6, 1975, abandoned. This application June 29, 1976, Ser. No. 701,050

Int. Cl.² G03C *1/06, 5/54, 1/40, 1/48*

U.S. Cl. 96—73 **32 Claims**

30. An image transfer film unit comprising

a. a photographic element including

1. a layer containing a blue-sensitive silver halide emulsion having associated therewith an immobile material capable of releasing a mobile yellow image dye,
2. a layer containing a green-sensitized silver halide emulsion having associated therewith an immobile material capable of releasing a mobile magenta image dye, and
3. a layer containing a red-sensitized silver halide emulsion having associated therewith an immobile material capable of releasing a mobile cyan image dye, wherein each of said silver halide emulsions comprises silver halide grains having metal dopants occluded therein, said grains being substantially unfogged on their surfaces and being chemically sensitized on their surfaces

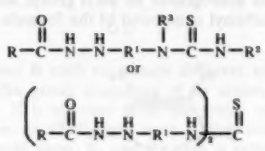
1. to a level which will provide a maximum density of less than 0.4 when developed in a test surface developer of the composition indicated below for 5 minutes at 27° C after exposure to a light intensity scale for a fixed time of from 1×10^{-2} to 1 second when said photosensitive composition is coated at a coverage of between about 3 and 4 g of silver per square meter, and
2. to at least a level which would provide a maximum density of at least 0.5 using undoped silver halide grains of the same grain size and halide composition when coated, exposed and developed in like manner,

b. an image-receiving layer,

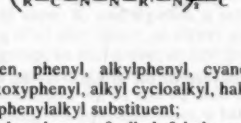
c. means containing and adapted to introducing an alkaline processing composition into contact with said silver halide emulsions,

d. a silver halide surface developing agent located in said processing composition of said photographic element, and

e. from 0.5 to 25 mg per mole of silver of a nucleating agent incorporated within at least one of said silver halide emulsion layers, said nucleating agent having the formula



or



wherein

R is hydrogen, phenyl, alkylphenyl, cyanophenyl, halophenyl, alkoxyphenyl, alkyl cycloalkyl, haloalkyl, alkoxyalkyl or a phenylalkyl substituent;

R^1 is a para-phenylene or 3-alkyl, 3-halo- or 3-alkoxy-substituted para-phenylene group;

R^2 is an alkyl substituent having from 1 to 12 carbon atoms; a cycloalkyl substituent; a haloalkyl, alkoxyalkyl or phenylalkyl substituent; phenyl or naphthyl; or an alkylphenyl, cyanophenyl, halophenyl or alkoxyphenyl substituent;

R^3 is hydrogen, benzyl, 4-alkoxybenzyl, 4-halobenzyl or 4-alkylbenzyl;

said alkyl moieties of R have from 1 to 4 carbon atoms;

said alkyl moieties, except as otherwise noted, in each instance include from 1 to 6 carbon atoms; and

said cycloalkyl moieties have from 3 to 10 carbon atoms;

the test surface developer consisting essentially of:

water (52° C)	500.0 cc
N-methyl-p-aminophenol sulfate	2.5 grams
sodium sulfite, desiccated	30.0 grams
hydroquinone	2.5 grams
sodium metaborate	10.0 grams
potassium bromide	0.5 grams
water to make 1 liter.	

4,030,926

LIGHT-SENSITIVE MATERIAL CONTAINING A DYE-FORMING COMBINATION OF A HETEROCYCLIC COMPOUND AND A CYCLIC DIHALODICARBONYL COMPOUND IN A POLYMERIC BINDER

Kurt-Rainer Stahlke, Krefeld; Werner Krafft; Rudolf Meyer, both of Leverkusen, and Hans Jürgen Rosenkranz, Krefeld, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed July 7, 1975, Ser. No. 593,305

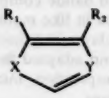
Claims priority, application Germany, July 11, 1974, 2433373

Int. Cl.² G03C *1/52*

U.S. Cl. 96—90 R **5 Claims**

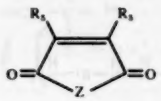
1. A light sensitive storage material for optical data recording comprising in a supported or self-supporting layer comprised of a polymeric hydrophobic binder selected from the group consisting of homopolymers and copolymers of mono-

mers which have copolymerizable olefinic double bonds, polyvinyl acetals and cellulose esters and a dye-forming combination of a heterocyclic compound of the formula



I

X represents oxygen, sulfur or the group >N—R_3,
Y represents nitrogen or the group C—R_4,
R_1 and R_2, which may be the same or different represent hydrogen or an alkyl or aryl group of may together represent the group required for completing a condensed benzene or naphthalene ring which may be substituted,
R_3 represents hydrogen or an alkyl or aryl group and
R_4 represents hydrogen or an alkyl group; and of a cyclic dihalodicarbonyl compound of the formula



II

in which
Z represents oxygen or the group >N—R_6 or

R_5 represents chlorine or bromine,
R_6 represents hydrogen or an alkyl group and
R_7 and R_8, which may be the same or different represent hydrogen or an alkyl group said heterocyclic compound of formula I and said cyclic dihalodicarbonyl compound of formula II being in amounts effective to provide said dye-forming combination upon exposure to ultraviolet light in a first range of wavelengths with capability of forming an image which is in a state of luminescence upon exposure to ultraviolet light in a second range of wavelengths not including said first range, and in a proportion of said heterocyclic compound of formula I being in at least double the molar quantity of the compound of formula II.

4,030,927

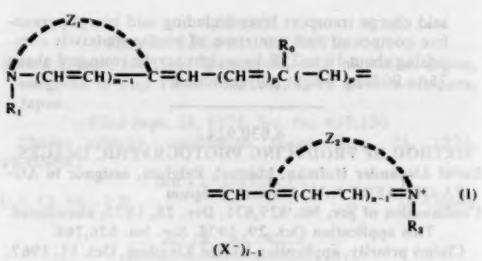
SUPERSENSITIZING COMBINATIONS OF HALOGEN SUBSTITUTED BENZOTRIAZOLES AND CYANINE DYES

Tadaaki Tani, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 14, 1976, Ser. No. 649,000
Claims priority, application Japan, Jan. 16, 1975, 50-7309
Int. Cl.² G03C *1/14, 1/19, 1/34, 1/40*
U.S. Cl. 96—100 **21 Claims**

1. A silver halide photographic emulsion supersensitized by a combination of

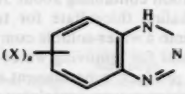
1. at least one cyanine sensitizing dye containing therein two 5- and/or 6-membered nitrogen-containing heterocyclic nuclei, which may be the same as or different from each other, and which are attached, through a conjugated methine chain consisting of three, five or seven methine groups, to each other, wherein the cyanine sensitizing dye has the following General Formula (I), which represents a resonance structure:



(I)

wherein *l*, *m* and *n* each represents 1 or 2, *p* represents 0, 1 or 2, R_9 represents hydrogen atom, an alkyl group, a carboxyalkyl group, a hydroxyalkyl group, an alkoxy group, an alkylthio group, an aralkyl group or an aryl group, and X^- represents an inorganic or organic acid anion, where the dye forms an intermolecular salt when *l* is 1, R_1 and R_2 each represents an aliphatic group, which may be saturated or unsaturated, or an aryl group, an Z_1 and Z_2 each represents a non-metallic atomic group necessary to complete a 5- or 6-membered nitrogen-containing heterocyclic ring; and

2. at least one benzotriazole compound substituted with at least one halogen atom having the following formula;



wherein X represents a chlorine, bromine or iodine atom, and s represents an integer from 1 to 4, and where when *s* equals 2, 3 or 4, the halogen atom substituents may be the same as or different from one another, both (1) and (2) being present in supersensitizing amounts.

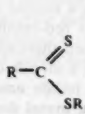
4,030,928

PROCESS OF SENSITIZING SILVER HALIDE EMULSION WITH A DITHIOESTER

Siegfried Gahler, Wolfen; Karl-Wilhelm Junge, Dessau; Gunther Fischer, Leipzig; Steffen Scheithauer, and Horst Viola, both of Dresden, all of Germany, assignors to VEB Filmfabrik Wolfen-Fotochemisches Kombinat, Wolfen, Germany

Filed Nov. 18, 1975, Ser. No. 632,936
Int. Cl.² G03C *1/28*
U.S. Cl. 96—107 **5 Claims**

1. Method for increasing the sensitivity of a photographic silver halide-gelatin emulsion which is chemically ripened comprising at the beginning of the chemical ripening adding to the emulsion a dithioester of the formula



in which R is alkyl, α-hydroxyalkyl, α-hydroxyaralkyl, phenyl fluorenyl-3- or o- or p-substituted phenyl or α-naphthyl, the o- or p- located substituents being a F, OH, dialkylamino, sulfo, phenyl, phenylazo or anilidocarbonyl group and R_1 is alkyl or aralkyl in the proportion of about 0.5 to 50 mg. dithioester sensitizer per mole silver halide.

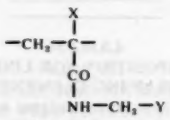
4,030,929

PHOTOGRAPHIC SILVER HALIDE EMULSION

Karsten-Josef Idel, Krefeld; Wilhelm Saleck, Schildgen; Erich Wolff, Leverkusen, and Dieter Freitag, Krefeld, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Sept. 14, 1976, Ser. No. 723,084
Claims priority, application Germany, Sept. 19, 1975, 2541754
Int. Cl.² G03C 1/72
U.S. Cl. 96—114 5 Claims

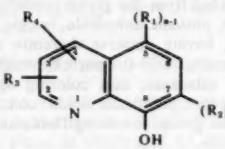
1. A light sensitive photographic silver halide emulsion containing from 500 mg to 500 g per mol of silver halide of a copolymer comprising 0.1 to 20 mol% of recurring structural unit of the formula I:



in which

X represents hydrogen, halogen or an alkyl group having 1 to 4 carbon atoms, and

Y represents an 8-hydroxyquinoline group of the formula II attached to the remainder of formula I through its 5- or 7-position:



(II)

in which

R_1 or R_2 represents hydrogen or an alkyl group having 1 to 4 carbon atoms,

R_3 and R_4 which may be the same or different represent hydrogen or an alkyl group having 1 to 4 carbon atoms, and is 1 when the 8-hydroxyquinoline group is attached through its 5-position, and 2 when the 8-hydroxy quinoline group is attached through its 7-position and 80 to 99.9 mol % of recurring structural units derived from one or more ethylenically unsaturated copolymerisable comonomers consisting essentially of water soluble compounds.

4,030,930

HEAT-DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Kenji Sashihara; Takao Masuda; Yasuhiro Noguchi; Nobuyoshi Sekikawa, all of Asaka, and Tadao Shishido, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 18, 1975, Ser. No. 550,503
Claims priority, application Japan, Feb. 15, 1974, 49-18378
Int. Cl.² G03C 1/02, 1/76
U.S. Cl. 96—114.1 9 Claims

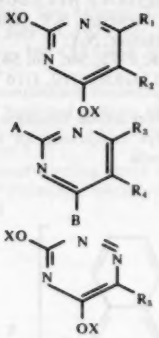
1. A heat-developable light-sensitive material comprising a support having thereon one or more layers containing

a. an organic silver salt oxidizing agent;

b. a catalytic amount of about 0.001 to about 0.5 mole per mole of (a) of a light-sensitive silver halide or a compound capable of forming a light-sensitive silver halide through reaction with the organic silver salt component (a);

c. a reducing agent; and

d. at least one compound represented by the following general formulae (I) to (III)



(I)

(II)

(III)

in which A and B each represents different substituents selected from the group consisting of an amino group and a —OX group; X is selected from the group consisting of a hydrogen atom, an alkali metal atom, a silver atom, a mercury atom and a gold atom; R_1 and R_2 each is selected from the group consisting of an alkyl group, an alkoxy group, an aralkyl group, an allyl group, an acyl group, an aryl group, an aryloxy group, each having up to 21 carbon atoms, a hydrogen atom and a halogen atom; and R_3, R_4 and R_5 each is selected from the group consisting of a hydrogen atom, a halogen atom and an alkyl group having up to 21 carbon atoms, said compound represented by the general formulae (I) to (III) being present in an amount of about 1×10^{-3} to about 5 moles per mole of the silver salt oxidizing agent (a); and wherein said components (a) to (d) may be present in the same layer or may be distributed individually or in combination in more than one layer.

4,030,931

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Yasuhiro Noguchi; Toshinao Ukai; Kenji Sashihara, and Takao Masuda, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 19, 1975, Ser. No. 578,833
Claims priority, application Japan, May 17, 1974, 49-55114
Int. Cl.² G03C 1/02
U.S. Cl. 96—114.1 21 Claims

1. A heat-developable light-sensitive material comprising a support having coated thereon at least one layer containing (a) an organic silver salt, (b) a light-sensitive silver halide or a light-sensitive silver halide-forming component and (c) a reducing agent comprising at least one ester selected from the group consisting of

1. esters of (a) mono- or poly-hydric alcohols or phenols and (b) carboxylic acids derived from phenol derivatives in which at least one of the o-positions thereof is substituted with a substituent selected from the group consisting of an alkyl group having 1 to 20 carbon atoms, a cycloalkyl group having 5 to 7 carbon atoms, and an alkylsulfonyl group having 1 to 20 carbon atoms, and

2. esters of (a) mono- or poly-carboxylic acids and (b) alcohols derived from polyhydric phenols in which at least one of the o-positions thereof is substituted with a substituent selected from the group consisting of an alkyl group having 1 to 20 carbon atoms, a cycloalkyl group having 5 to 7 carbon atoms, and an alkylsulfonyl group having 1 to 20 carbon atoms

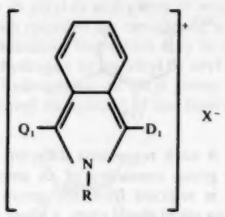
wherein said reducing agent component (c) is present in an amount ranging from about 0.1 mole to about 10 moles per mole of said organic silver salt component (a).

4,030,932
SILVER HALIDE SENSITIZED WITH DYES CONTAINING AN ISOINDOLE NUCLEUS

Derek David Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 28, 1975, Ser. No. 581,463
Int. Cl.² G03C 1/10, 1/16
U.S. Cl. 96—127 **14 Claims**

1. A photographic silver halide emulsion spectrally sensitized with a cyanine dye comprising an isoindole nucleus represented by the formula



wherein R is an alkyl or substituted alkyl group;

Q_1 is a methine chain having an odd number of carbon atoms terminated with a nitrogen atom contained in a basic heterocyclic nucleus of the type used in cyanine dyes;

D_1 is a halogen atom, an alkoxy group, or a methine chain having an even number of carbon atoms terminated with a nitrogen atom contained in a basic heterocyclic nucleus of the type used in cyanine dyes; and

X^- represents an anion.

4,030,933
PHOSPHORUS AND HALOGEN CONTAINING POLYMERS OF BIS-HYDROXYETHYL TEREPHTHALATE AS FLAME RETARDANT ADDITIVES

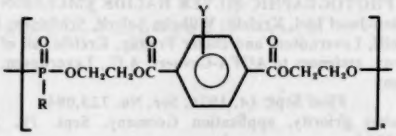
Anthony B. Conciatori, Chatham, and Robert W. Stackman, Morristown, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 7, 1975, Ser. No. 566,005
Int. Cl.² C09K 3/28
U.S. Cl. 106—15 FP **18 Claims**

1. A process for preparing phosphorus and halogen containing polymers useful as flame retardant additives which process comprises reacting a halogenated derivative of bis-hydroxyethyl terephthalate with a halogen containing phosphorus monomer having the formula

wherein R represents a radical selected from the group consisting of (a) alkyl, (b) bromoalkyl, (c) chloroalkyl, (d) alkylamido and (e) dialkylamido radicals, wherein the alkyl substituents of the foregoing may contain from 1 to 10 carbon atoms, (f) cyclohexyl, (g) phenyl, (h) benzyl, (i) tolyl and (j) xylyl, and X represents a halogen atom wherein said reaction is carried out in a molar ratio of halogenated derivative of bis-hydroxyethyl terephthalate to halogen containing phosphorus monomer of from about 0.33 to 1 to about 3 to 1, and at a temperature of from about −40° to about 200° C. and a pressure of from about 0.01 to about 100 atmospheres.

9. A phosphorus and halogen containing polymer of the formula



wherein the Y attached to the aromatic ring represents 1 to 4 halogen atoms; the R represents a radical selected from the group consisting of (a) alkyl, (b) bromoalkyl, (c) chloroalkyl, (d) alkylamido and (e) dialkylamido radicals, wherein the alkyl substituents of the foregoing may contain from 1 to 10 carbon atoms, (f) cyclohexyl, (g) phenyl, (h) benzyl, (i) tolyl and (j) xylyl; and n is an integer greater than 1.

4,030,934
COLORING COMPOSITION FOR LINE- OR PATTERN-DRAWING ELEMENTS

Zenshiro Iijima, Tokyo, Japan, assignor to Kawamura Seichu Kogyo Kabushiki Kaisha, Tajimi (Gifu), Japan

Filed Apr. 24, 1975, Ser. No. 571,238
Claims priority, application Japan, Aug. 28, 1974, 49-98642; Aug. 7, 1974, 49-90503
Int. Cl.² C08D 11/00, 11/06
U.S. Cl. 106—23 **8 Claims**

1. A heat-erasable coloring composition for line-or pattern-drawing elements which comprises at least one acidic sublimating substance selected from the group consisting of benzoic acid salicylic acid, phthalic anhydride, maleic anhydride and mixtures thereof, having disperse thereinto a coloring agent present in an amount 0.001-0.1 parts by weight per part of acidic sublimating substance, said coloring agent being capable of developing its color under acidic conditions and being selected from the group consistng rhodamine lactone and crystal violet lactone.

2. A composition according to claim **1**, additionally comprising a metal salt of a higher fatty acid selected from the group consisting of calcium stearate and calcium oleate in an amount of 0.01–0.5 parts by weight per part of acidic sublimating substance to increase the sublimation rate of said acidic sublimating substance.

4,030,935
GLASS

Mikhail Mikhailovich Shults, prospekt Engelsa, 63, korpus 3, kv. 51; Anatoly Ivanovich Parfenov, Novocherkassky prospekt, 40, kv. 30, both of Leningrad; Alexandr Dmitrievich Shnypikov, Gatchinsky raion poselok Kummunar, ulitsa Pionerskaya, 11, kv. 64, Leningradskaya oblast; Vladimir Georgievich Krunchak, Institutsky prospekt, 9, kv. 49; Sarra Borisovna Evnina, V.O. 15 Linia, 16, kv. 19, both of Leningrad; Vladimir Alexandrovich Dolidze, ulitsa Sergo Zakariadze, 10, kv. 10, and Valentina Mikhailovna Tarasova, prospekt Plekhanova, 148, kv. 19, both of Tbilisi, all of U.S.S.R.

Filed Apr. 22, 1976, Ser. No. 679,485
Int. Cl.² C03C 3/04, 3/10
U.S. Cl. 106—52 **1 Claim**

1. Glass essentially consisting of the following components, in terms of percent by weight:

silicon dioxide	58.5 to 64.7
zirconium dioxide	14.1 to 20.0
aluminum oxide	0.1 to 3.0
lanthanum oxide	0.1 to 3.0
strontium oxide	0.1 to 4.0
calcium oxide	0.1 to 3.0
sodium oxide	0.1 to 6.0
lithium oxide	1.2 to 5.0
potassium oxide	3.0 to 14.0

4,030,936

BINDER FOR ALUMINA CONTAINING REFRACTORIES

Melvin M. Willis, 5232 Kentwater Pl., Yorba Linda, Calif. 92686

Filed July 7, 1975, Ser. No. 593,210
Int. Cl.² C04B 35/10
U.S. Cl. 106—65 10 Claims

7. A refractory mixture consisting essentially of an alumina containing mixture having between about 75 and 90 percent by weight of alumina and between 1 and 15 percent by weight of a binder consisting essentially of:

H_3PO_4: 8 moles

$Al_2(SO_4)_3$: 0.5 to 1.5 moles

Na_2SO_4: 0.5 moles to 5 moles.

4,030,937

CERAMIC DIELECTRIC MATERIAL HAVING IMPROVED TEMPERATURE STABILITY

Tomotoshi Nakai; Kazuaki Utsumi, and Tomeji Ohno, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1976, Ser. No. 673,120
Claims priority, application Japan, Apr. 9, 1975, 50-43592
Int. Cl.² H01B 3/12; C04B 35/46, 35/50
U.S. Cl. 106—73.2 8 Claims

1. A ceramic composition containing $La_2Ti_2O_7$, $Sr_2Nb_2O_7$, and ½ $Mg_{2x}Ti_{2-2x}O_{4-2x}$, where x lies in the range 0 to 1.0, represented as

$$\alpha[La_2Ti_2O_7] \cdot \beta[Sr_2Nb_2O_7] \cdot \gamma[\tfrac{1}{2}Mg_{2x}Ti_{2-2x}O_{4-2x}].$$

where $\alpha + \beta + \gamma = 1.0$, and falling within the polygonal region surrounded by the lines A-1-B1-C1-D1-E1-F1-G1 on a ternary coordinate plane, in which said A1, B1, C1, D1, E1, F1 and G1 have the values as follows:

	α	β	γ
A1	1.00	0	0
B1	0.20	0	0.80
C1	0	0.25	0.75
D1	0	0.40	0.60
E1	0.20	0.50	0.30
F1	0.20	0.65	0.15
G1	0.15	0.85	0

and compositions on the line A1-B1, line C1-D1, and line G1-A1 being excluded from said composition.

4,030,938

METHOD FOR THE MANUFACTURE OF BOROSILICATE GLASSES

Ian M. Thomas, Temperance, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 3, 1976, Ser. No. 655,024
Int. Cl.² C03C 3/08; C04B 35/16
U.S. Cl. 106—73.5 5 Claims

1. A process for producing an amorphous carbon free, homogeneous borosilicate product comprising

a. combining a boron alkoxide and an at least partially hydrolyzed silicon tetraalkoxide

b. fractionally distilling the product of step (a) in the presence of free water for a time sufficient to remove all alkanol by product.

4,030,939

CEMENT COMPOSITION

William A. Mallow, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed July 30, 1975, Ser. No. 600,258
Int. Cl.² C04B 35/16
U.S. Cl. 106—74 14 Claims

1. A cement composition consisting essentially of,

a. spray-dried hydrated sodium silicate powder having a weight ratio of SiO_2:Na_2O in the range of from about 2.4:1 to about 3.22:1,

b. a silica polymer-forming agent selected from the group consisting of potassium silicofluoride and sodium silicofluoride, and

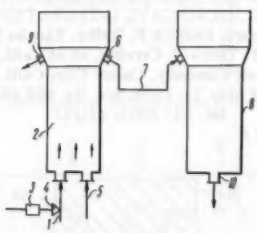
c. water.

4,030,940

METHOD OF PRODUCING FINE DISPERSE ALKYLATED SILICA COMPOUNDS

Alexei Alexeevich Chuiko, Prospekt Nauki 99, kv. 48; Valentin Anatolievich Tertykh, ulitsa Sapernoe pole 9/21, kv. 40; Vilyam Alexandrovich Sobolev, ulitsa P.Lumumby 13, kv. 12; Valery Mikhailovich Maschenko, ulitsa Oktyabrskoi revoljutsii, 17/5, kv. 11; Vyacheslav Valentinovich Pavlov, ulitsa K.Libknekhta, 22, kv. 7; Alexei Dmitrievich Chugai, ulitsa Gvardeiskaya, 4, all of, Kiev; Nikolai Vasilievich Khaber, ulitsa Sevastopolskaya, 4, kv. 6; Anatoly Borisovich Kondratenko, ulitsa Nikolaevoi-Tereshkovoi, 30, both of Kalush, Ivano-Frankovskoi oblasti; Vasily Ivanovich Vatamanjuk, ulitsa Sovetskaya, 98, kv. 16, Ivano-Frankovsk; Mikhail Ivanovich Khoma, ulitsa Sevastopolskaya, 8, Kalush, Ivano-Frankovskoi oblasti; Alexandr Nikolaevich Kutin, ulitsa Polyarnaya, 20, kv. 8, Moscow; Jury Davydovich Shaposhnikov, ulitsa Scherbakovskaya, 5, kv. 153, Moscow, and Malvina Leontievna Galashina, 3 Frunzenskaya ulitsa 1, kv. 91, Moscow, all of U.S.S.R.

Filed Nov. 3, 1975, Ser. No. 628,243
Int. Cl.² C09C 1/28
U.S. Cl. 106—308 Q 6 Claims



1. A method of producing fine-disperse alkylated silica and controlling the concentration of grafted alkyl groups on said silica, comprising the steps of treating fine-disperse silica with vapours of water at a temperature of 110°–120° C to a humidification degree ranging from 2 to 40 micromoles H_2O/m^2 SiO_2; treating the thus humidified fine-disperse silica with vapours of alkylchlorosilane at a temperatue of 250°–310° C in a fluidized bed; isolating the resultant fine-disperse aklylated silica from gaseous reaction products at a temperature of 390°–400° C.

4,030,941
METHOD FOR REDUCING THE VISCOSITY AND FOR REFINING KAOLIN CLAYS

Albert C. Kunkle, and Carl E. Kollmar, Jr., both of Macon, Ga., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 591,737, June 30, 1975. This application Oct. 12, 1976, Ser. No. 731,141
Int. Cl.² C09C 1/42
U.S. Cl. 106—309 27 Claims

1. A method for reducing the viscosity of crude kaolin clay ores for producing clay pigments comprising contacting a clay/water slurry of said crude kaolin clay with an inorganic polymer complex having the general formula:

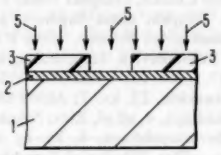
$$[Al(OH)_x A_{3-x}]_y$$

wherein $x = 6$ to 24, $y = 1.0$ to 2.75 and A is selected from the group consisting of Cl^-, $(SO_4^=)_{0.5}$ and NO_3^-

4,030,942
SEMICONDUCTOR MASKING FOR DEVICE FABRICATION UTILIZING ION IMPLANTATION AND OTHER METHODS

William Andrew Keenan, Montpelier, and Charles Thomas Kroll, Essex Center, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,141
Int. Cl.² H01H 21/265
U.S. Cl. 148—1.5 16 Claims

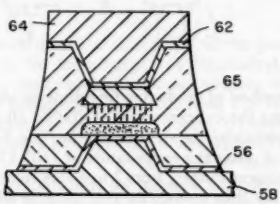


1. In a process of manufacturing semiconductor devices utilizing ion implantation to implant ions into a region of a semiconductor body, the improvement comprising the steps of: depositing aluminum nitride as an implantation screen on the surface of the implantation region; ion implanting said ions through said screen; and thereafter dissolving said aluminum nitride in water.

4,030,943
PLANAR PROCESS FOR MAKING HIGH FREQUENCY ION IMPLANTED PASSIVATED SEMICONDUCTOR DEVICES AND MICROWAVE INTEGRATED CIRCUITS

Don H. Lee, Agoura; Kenneth P. Weller, Rancho Palos Verdes, and William F. Thrower, Cerritos, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 21, 1976, Ser. No. 688,662
Int. Cl.² H01L 21/265
U.S. Cl. 148—1.5 4 Claims



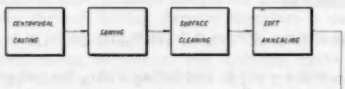
1. A planar process for fabricating high frequency semiconductor devices including the steps of:

a. providing a high-resistivity semiconductor substrate,
b. forming an insulating ion implantation mask on the surface of said substrate,
c. implanting conductivity type determining ion species through an opening in said mask and into said substrate to form a buried region therein,
d. selectively implanting additional ion species above said buried region to thereby form a semiconductor device and including a region thereof extending to the surface of said substrate,
e. removing a selected region of said substrate to thereby expose at least a portion of said buried region, and
f. making ohmic contacts to both said buried region and said implanted region extending to the substrate surface, whereby appropriate operating or modulating bias or control potentials may be applied to said ohmic contacts to control the flow of microwave energy from said semiconductor device.

4,030,944
PRODUCTION OF ANNULAR PRODUCTS FROM CENTRIFUGALLY CAST STEEL STRUCTURES

Karel Sommer; Jiří Zdrazil; Milan Kubínek, all of Brno; Jarolím Bahna, Ilava; Stanislav Kyselica, Trencianske Teplice; František Habrovec, and Jiří Škarek, both of Brno, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Apr. 15, 1976, Ser. No. 677,427
Int. Cl.² B22D 13/02; C21D 9/08
U.S. Cl. 148—2 11 Claims



1. In a method of forming annular products from a hypereutectoid steel composition which has been initially centrifugally cast into a hollow ingot having the shape of a solid of revolution, the steps of initially cooling the just-cast ingot from the casting temperature to a temperature below the eutectoid temperature of the steel composition, directly dividing the ingot into a plurality of intermediate annuli during the initial cooling step, soft-annealing the resulting intermediates at a prescribed temperature above the eutectoid temperature to obtain a spheroidized carbidic phase, re-heating the soft-annealed intermediates to a temperature in the austenitization range, and hot-working the re-heated intermediates into the form of the final product.

4,030,945
RINSING COATED METALLIC SURFACES

Wilbur S. Hall, Plymouth Meeting, and Lester Steinbrecher, Southampton, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 152,993, June 14, 1971, Pat. No. 3,795,546, which is a continuation-in-part of Ser. No. 791,762, Jan. 16, 1969, Pat. No. 3,592,699, and Ser. No. 791,801, Jan. 16, 1969, Pat. No. 3,585,084, each is a continuation-in-part of Ser. No. 554,336, June 1, 1966, abandoned. This application Jan. 4, 1973, Ser. No. 321,067
The portion of the term of this patent subsequent to June 15, 1988, has been disclaimed.
Int. Cl.² C23F 7/26
U.S. Cl. 148—6.2 46 Claims

1. A method for modifying the properties of a polymeric resinous-coated metallic surface comprising: forming a poly-

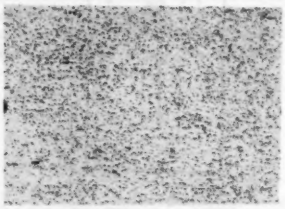
meric resinous coating on a metallic surface by treating the surface with an acidic aqueous coating composition comprising a polymeric resinous coating-forming material and an oxidizing agent and thereafter treating the polymeric resinous coating with an aqueous rinse solution containing hexavalent chromium in an amount at least sufficient to improve the corrosion resistant properties of said coating.

4,030,946

ELIMINATING PRIOR PARTICLE BOUNDARY DELINEATION

Donald R. Muzyka, Reinholds, and Robert F. Walley, Shoemakersville, both of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Apr. 13, 1976, Ser. No. 676,508
Int. Cl.² B22F 1/04
U.S. Cl. 148—11.5 P **23 Claims**



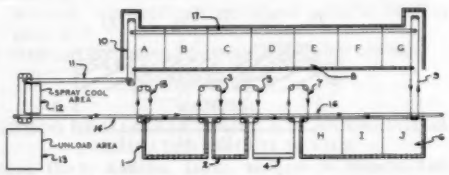
1. A method for substantially eliminating prior powder particle boundary delineation in articles made from prealloyed powder densified to at least about 99% of theoretical density which includes placing in an enclosure a predetermined amount of the prealloyed powder with a predetermined amount of a surfactant and having substantially less then theoretical density, said surfactant comprising at least one metallic element which is a strong oxide and sulfide former and a weak carbide former as compared to the elements of said prealloyed powder, heating said prealloyed powder and surfactant to a predetermined temperature above the carbide solvus temperature and below the solidus temperature of said prealloyed powder, and densifying said prealloyed powder while it is above said carbide solvus temperature to at least about 99% of theoretical density with said surfactant available at the surfaces of the powder particles.

4,030,947

HEATING TREATMENT METHOD AND SYSTEM OF UTILIZING SAME

Eugene L. Kemper, 38520 Delta Drive, Mount Clemens, Mich. 48043

Filed Sept. 10, 1975, Ser. No. 612,190
Int. Cl.² C21D 1/04
U.S. Cl. 148—12.9 **16 Claims**



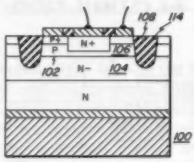
1. A method for heat treating a metallic substance, comprising the steps of:
solution heat treating said metallic substance by causing contact between said metallic substance and a predetermined fluid solution-heat-treat media;
quenching the solution heat treated metallic substance by causing contact between said solution heat treated metallic substance and a predetermined fluid quenching media;
subjecting said metallic substance to a predetermined ultrasonic treatment during said quenching step;
naturally aging said metallic substance; and
artificially aging said metallic substance.

4,030,948

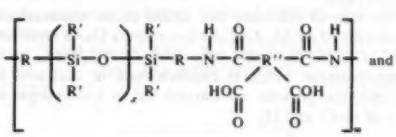
POLYIMIDE CONTAINING SILICONES AS PROTECTIVE COATING ON SEMICONDUCTOR DEVICE

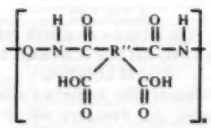
Abe Berger, 1504 Barclay Place, Schenectady, N.Y. 12309

Filed July 21, 1975, Ser. No. 597,971
Int. Cl.² H01L 21/56
U.S. Cl. 148—33.3 **9 Claims**

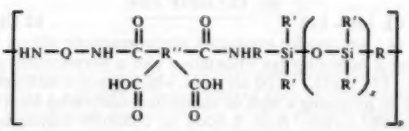


1. A semiconductor element comprised of a body of semiconductor material having at least two regions of opposite-type semiconductivity and a P-N junction disposed between each pair of regions of opposite type semiconductivity:
and end portion of at least one P-N junction exposed at a surface of the body; and
at least one layer of conformal protective coating material disposed on the exposed end portion of the at least one P-N junction, the layer comprising a copolymer which is a reaction product of a tetracarboxylic acid dianhydride, a diamine and a di(aminoalkyl) siloxane, which is a copolymer having recurring structural units of a block copolymer of the formulas:


and



and a random polymer of the formula:



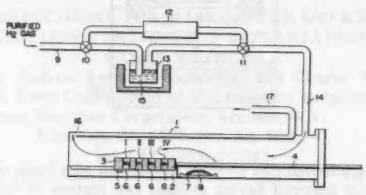
wherein:
R is a divalent hydrocarbon radical:
R′ is a monovalent hydrocarbon radical wherein each R′ may be the same radical or a different radical from the others;
R″ is a tetravalent organic radical;
Q is a divalent organic radical which is a residue of an organic diamine;
x is an integer having a value of from 1 to 10:

m is an integer greater than 1 and
n is an integer greater than 1,
p is an integer greater than or equal to 0,
and the recurring units designated by m, n, and p are such that the mole percent of silicone diamine in the total polymer constitutes 18 to 45 mole percent of the total diamines in the copolymer.

4,030,949
METHOD OF EFFECTING LIQUID PHASE EPITAXIAL GROWTH OF GROUP III-V SEMICONDUCTORS

Yoshiji Horikoshi, Seki, and Yoshitaka Furukawa, Musashino, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed June 26, 1975, Ser. No. 590,554
Claims priority, application Japan, July 4, 1974, 49-75817
Int. Cl.² H01L *21/208*
U.S. Cl. 148—171 **4 Claims**



1. In a method for manufacturing a buried type semiconductor laser comprising:
a. the step of preparing a GaAs single crystalline substrate;
b. the step of effecting alternately the liquid phase epitaxial crystal growth of an $Al_{0.3}GA_{0.7}As$ layer and an $Al_{0.05}Ga_{0.95}As$ layer on said GaAs single crystalline substrate;
c. the step of coating SiO_2 on the surface of said $Al_{0.05}Ga_{0.95}As$ layer to form a stripe-shaped pattern and etching said $Al_{0.05}Ga_{0.95}As$ layer by an etching solution to form a stripe-shaped $Al_{0.05}Ga_{0.95}As$ layer on said $Al_{0.3}Ga_{0.7}As$ layer; and
d. the step of effecting the liquid phase epitaxial crystal growths of an $Al_{0.3}Ga_{0.7}As$ layer and a GaAs layer on said $Al_{0.3}Ga_{0.7}As$ layer and stripe-shaped $Al_{0.05}Ga_{0.95}As$ layer;
the improvement which is characterized in that said liquid phase epitaxial growths are carried out in a mixed gas atmosphere of GaCl and H_2.

4,030,950
PROCESS FOR CUBE-ON-EDGE ORIENTED BORON-BEARING SILICON STEEL INCLUDING NORMALIZING

Jack W. Shilling, Monroeville; Amitava Datta, Pittsburgh, and Frank A. Malagari, Jr., Freeport, all of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

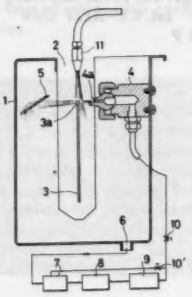
Filed June 17, 1976, Ser. No. 696,966
Int. Cl.² H01F *1/04*
U.S. Cl. 148—112 **12 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1870 (G/O_e) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel containing from 0.02 to 0.06% carbon, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, no more than 0.008% aluminum and from 2.5 to 4.0% silicon; casting said steel; hot rolling said steel; cold rolling said steel; decarburizing said steel, applying a refractory oxide base coating to said steel; and final texture annealing said steel; the improvement comprising the steps of normalizing said cold roller steel at a temperature of from 1300 to 2000° F in a hydrogen-bearing atmosphere having a dew point of from +20 to +110° F for a period of time sufficient to lower said steel's carbon content to a level below 0.005%, said temperature, dew point and time being monitored so as to result in a steel having at least 320 parts per million of oxygen, based on the total weight of the steel, within 10 microns of the surfaces of said steel; and forming an opaque refractory oxide base coating on said steel.

4,030,951
METHOD OF HARDENING SAW TEETH

Toushichi Ishizawa, Shizuoka, Japan, assignor to Fuji Sangyo Kabushiki Kaisha, Fujieda and Seiya Ishizawa, Shizuoka, both of, Japan

Filed May 24, 1976, Ser. No. 689,465
Claims priority, application Japan, May 26, 1975, 50-63205
Int. Cl.² C21D *9/24*
U.S. Cl. 148—147 **4 Claims**

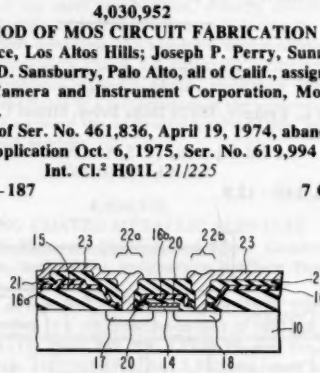


1. A method for hardening sawteeth comprising moving intermittently a band saw in the lengthwise direction thereof, forming in air a water stream running from a point forward at least from the top ends of sawteeth with respect to the moving direction of the band saw and contacting the water stream with the top ends of the sawteeth while the band saw is not moved, blowing flames to the top ends of the sawteeth in said state to blow away the running water at parts covering the top ends of the sawteeth by the force of the flames and heat only the top ends of the sawteeth at a prescribed hardening temperature, then moving the band saw againg and cooling the heated top ends of the sawteeth by the running water.

4,030,952
METHOD OF MOS CIRCUIT FABRICATION

Robert L. Luce, Los Altos Hills; Joseph P. Perry, Sunnyvale, and James D. Sansburry, Palo Alto, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Continuation of Ser. No. 461,836, April 19, 1974, abandoned.
This application Oct. 6, 1975, Ser. No. 619,994
Int. Cl.² H01L *21/225*
U.S. Cl. 148—187 **7 Claims**



1. A method of fabricating a metal-oxide-semiconductor structure in a semiconductor substrate, said structure having source and drain regions separated by a gate region, comprising the steps of:
forming a layer of selected dopant-containing material on surface portions of said semiconductor substrate overlying said source and drain regions to be formed with simul-

taneous diffusion of dopant from said material into said substrate,

removing portions of said selected dopant-containing material over said source and drain regions,

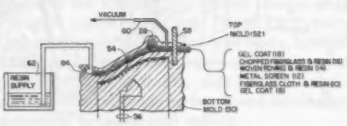
forming a first oxide insulation material on said semiconductor surface over said source and drain regions and beneath said dopant-containing material, and

forming a second oxide insulation material over said dopant-containing material and over exposed portions of said first oxide insulation material whereby said first oxide insulation material, said dopant-containing material, and said second oxide insulation material cooperatively function as a protective layer for said metal-oxide-semiconductor structure.

4,030,953
METHOD OF MOLDING FIBERGLASS REFLECTING ANTENNA

Joseph Fredrick Rutschow, Sunnyvale, and Bruno Zucconi, Alameda, both of Calif., assignors to Scala Radio Corporation, San Leandro and Milliflect, Sunnyvale, both of, Calif.

Filed Feb. 11, 1976, Ser. No. 657,045
Int. Cl.² H01Q 15/16
U.S. Cl. 156—79 **2 Claims**



1. Method of fabricating a fiberglass reflecting antenna, comprising the steps of:

a. spraying a gel coat layer into a first convex antenna mold, said first mold having a predetermined curvature;

b. applying a layer of resin impregnated fiberglass cloth on top of the gel coat in the first convex mold;

c. placing an electromagnetic reflecting surface on top of the layer of resin impregnated cloth;

d. placing a plurality of layers of dry fiberglass woven roving into the first convex mold on top of the reflecting surface;

spraying a gel coat layer into a second concave antenna mold, said second concave mold having both a shape and a predetermined curvature complimentary to said first convex mold;

f. applying a layer of chopped fiberglass and resin on top of the gel coat layer in the second mold;

g. anchoring a plurality of mounting brackets to said chopped fiberglass and resin layer in the second mold;

h. placing said first convex mold and said second concave mold together;

i. injecting resin into the space between said molds;

j. pressing said molds together while the injected resin hardens so that the electromagnetic reflecting surface assumes the predetermined curvature of said molds;

k. heating said molds to an elevated temperature that substantially relieves shrinkage induced stress in the fiberglass; and

l. removing the antenna from the molds after cooling.

4,030,954
METHOD OF MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

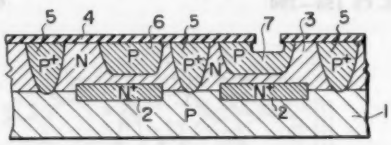
Noboru Horie, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 30, 1975, Ser. No. 617,991
Claims priority, application Japan, Sept. 30, 1974, 49-111472
Int. Cl.² H01L 7/50
U.S. Cl. 156—628 **8 Claims**

1. In a method of manufacturing at least two transistors, having current gains different from each other, in a semiconductor integrated circuit, the improvement comprising the steps of

a. providing a semiconductor substrate having at least first and second collector regions each having a first conductivity type, electrically isolated from each other, respectively extending to a principal surface of the semiconductor substrate,

b. diffusing an impurity of a second conductivity type, opposite to said first conductivity type, at the same time in said first and second collector regions, from said principal surface, to form first and second base regions in said first and second collector regions, respectively,



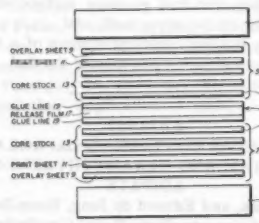
c. partially removing a surface portion of said first base region to form a depression therein, and

d. diffusing an impurity of said first conductivity type in said first base region beneath said depression and said second region from said principal surface, to form emitter regions therein, respectively.

4,030,955
METHOD OF MANUFACTURE DECORATIVE LAMINATE TO PROVIDE GLUE ADHERABLE BACK SURFACE

Christo Antonio, Princeton, and Wyman F. Uhl, Sterling, both of Mass., assignors to Litton Business Systems, Inc., Fitchburg, Mass.

Filed Nov. 5, 1974, Ser. No. 521,054
Int. Cl.² B32B 31/00
U.S. Cl. 156—235 **2 Claims**

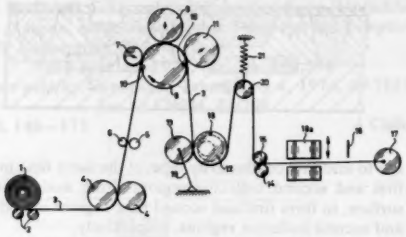


1. A process for forming a laminate comprising the steps of assembling a plurality of superimposed plies of thermosetting resin impregnated sheets between heated platens, placing a release medium between the heated platens and adjacent the back surface of the bottom most ply of said sheets, transferring a glueable coating from said release medium to said back surface while consolidating said assembly by applying heat and pressure through said heated platens and applying sufficient heat to cure said resin thereby firmly anchoring said glueable coating to said bottom-most ply, said glueable coating being formed of a substance including a material selected from the group consisting a polyvinyl alcohol, animal glue and starch.

4,030,956
METHOD OF MANUFACTURING PLASTIC BAGS IN A CONTINUOUS WAY

Arnoldus Willem Jan Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Continuation-in-part of Ser. No. 337,493, March 2, 1973, abandoned. This application Dec. 12, 1975, Ser. No. 640,133
Claims priority, application Netherlands, Mar. 15, 1972, 7203390
Int. Cl.² B32B 31/26
U.S. Cl. 156—290 6 Claims



1. A method of continuously manufacturing plastic bags from a length of thermoplastic foil having two superposed walls, comprising the steps of:

a. continuously moving the foil to bring the lower of the walls against a heating element while the upper wall remains exposed,

b. heating the lower wall, by means of the heating element, through its entire thickness to the plasticizing temperature of the foil and simultaneously heating the upper wall through only a portion of its thickness to the plasticizing temperature of the foil, the portion of the thickness of the upper wall extending to the upper surface of the upper wall remaining unplasticized at all times, the heating taking place along longitudinally spaced-apart lines transverse to both the longitudinal direction of the foil and the direction of movement of the foil,

I. without compressing the walls together against the heating element, and

II. while maintaining the portion of the superposed walls being heated in an untensioned condition,

c. thereafter moving the heated foil between first and second pressure surfaces to press the heated superposed walls together, the first pressure surface engaging the upper surface of the upper wall, and

d. maintaining the first pressure surface of a temperature below the softening temperature of the foil.

4,030,957
COPOLYAMIDES CONTAINING CAPROLACTAM, LAURICLACTAM AND HEXAMETHYLENE DIAMINE ADIPATE

Fritz Raabe, Bonn, and Eduard de Jong, Bonn-Beuel, both of Germany, assignors to Plate Bonn Gesellschaft mit beschrankter Haftung, Bonn, Germany

Division of Ser. No. 467,233, May 6, 1974, Pat. No. 3,950,297. This application Feb. 11, 1975, Ser. No. 548,966
Claims priority, application Germany, May 12, 1973, 2324159
Int. Cl.² C09J 3/16
U.S. Cl. 156—331 13 Claims

1. A process for heat-sealing together surfaces of materials comprising applying to at least one of the surfaces to be sealed a composition comprising a copolyamide consisting essentially of recurring units of caprolactam, lauriclactam, hexamethylene diamine adipate and a hexamethylene diamine salt of an aliphatic dicarboxylic acid of the formula

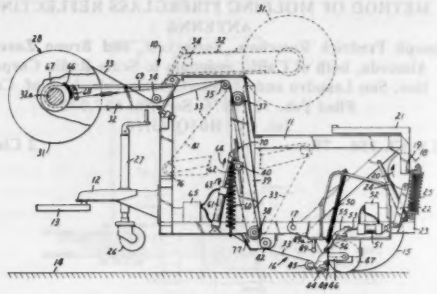
$$HOOC-(CH_2)_n-COOH \quad I$$

in which n is 7, 8, 10 or 11 joining said surfaces, heating the materials to be sealed to a temperature sufficient to melt the copolyamide and cooling the materials.

4,030,958
PAVEMENT-STRIPING APPARATUS

Heinrich F. Stenemann, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 9, 1976, Ser. No. 712,679
Int. Cl.² B26D 5/00; G05G 15/00
U.S. Cl. 156—350 12 Claims



1. Apparatus for applying a pavement-marking tape to a paved surface comprising:

a. a frame;

b. a support on the frame for rotatably supporting a roll of said tape;

c. an application head on the frame for applying tape to the paved surface comprising:

i. an engagement roller that is movable to and away from the paved surface;

ii. keeper means for holding tape adjacent the engagement roller such that movement of the engagement roller to the paved surface presses the tape into engagement with the paved surface;

iii. a pressure roller for pressing the tape after it has been engaged against the paved surface by the engagement roller; and

iv. cutter means for cutting tape that extends between the engagement roller and pressure roller after the engagement roller has been moved away from the paved surface;

the tape extending in a continuous length from the roll of tape to its position adjacent the engagement roller such that application of tape onto a paved surface by the engagement roller during movement of the apparatus along the paved surface applies a pulling force on the tape that results in unrolling of tape from the roll;

d. accumulator means located between the roll of tape and the application head and comprising a set of guides through which the tape is threaded, said guides being movable against an adjustable biasing pressure from a first position which provides a serpentine path for tape traveling from the roll of tape to the application head to at least a second position which provides a more direct path for the tape;

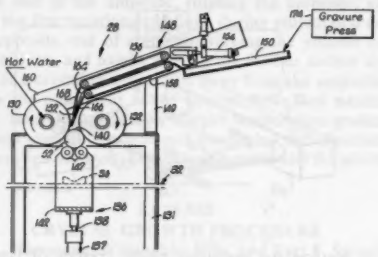
e. timer means for initiating movement of said engagement roller to and away from the paved surface; and

f. tape-starting means actuatable by said timer means prior to movement of said engagement roller to the paved surface and comprising means for relaxing said biasing pressure so as to allow easier movement of said accumulator from its first position to its second position.

4,030,959
APPARATUS FOR TRANSFERRING DESIGN IMAGE TO WAX ARTICLES

Merlin M. Meisner; Raymond M. Matulis, and James R. Mackey, all of Overland Park, Kans., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Division of Ser. No. 486,820, July 10, 1974, Pat. No. 3,974,014. This application Mar. 9, 1976, Ser. No. 665,255
Int. Cl.² B44B *9/00*; B32B *1/08*; C11C *5/02*
U.S. Cl. 156—457 **11 Claims**



1. Apparatus for transferring an ink design image from a sheet of waxed paper having said image on a waxed surface thereof, to a generally cylindrical wax body, comprising:

first and second elongated, adjacent, axially rotatable rollers positioned in parallel, side-by-side relationship to permit said waxed body to be placed in rotative bridging engagement between said rollers;

means to axially rotating said first and second rollers in unison in the same direction;

pressure means located to bear against the surface of said wax body remote from said rollers when said body is placed in rotative bridging contact therewith; and

means operable to insert said design bearing waxed sheet into the nip presented between one of said rollers and the wax body with said design facing the latter when said body is placed in said bridging position between said first and second rollers.

4. Apparatus for successively transfering design images from separate sheets of waxed paper having said image on a waxed surface thereof to cylindrical wax bodies, comprising:

finishing means for trueing the bodies and operable to remove surface irregularities therefrom including at least two elongated, adjacent, axially rotatable cylindrical rollers positioned in parallel, side-by-side alignment for permitting said cylindrical bodies to be successively placed in rotative, bridging contact therewith, means for rotating said rollers in unison in the same direction, and means for heating one of the rollers to a temperature sufficient to soften the surfaces of said wax bodies;

cooling means operable to harden the softened surfaces of said wax bodies by spraying the wax bodies with cooling water;

drying means including air blowing means for stripping water applied to wax bodies to effect cooling thereof;

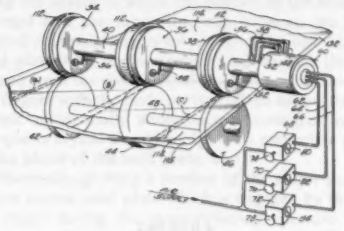
means for transferring said design image onto said waxed body including first and second elongated, axially rotatable transfer rollers positioned in parallel, side-by-side relationship for permitting said wax bodies so be placed in rotative, bridging contact between said first and second transfer rollers, means for axially rotating the latter in unison in the same direction, pressure means for bearing against the surfaces of said wax bodies remote from said first and second transfer rollers when the bodies are placed therebetween in rotative bridging contact therewith, means operable to insert said design image facing the latter when said body is placed in said bridging position and means for heating at least one of said rollers.

means for stripping said sheets from said wax articles; and means for moving said wax bodies successively through the finishing, cooling, drying, transfer and stripping sections of said apparatus.

4,030,960
PNEUMATIC SEALING WHEEL

Robert H. Pratt, Milwaukee, Wis., assignor to Pratt Manufacturing Corporation, Milwaukee, Wis.

Filed Sept. 19, 1975, Ser. No. 615,132
Int. Cl.² B30B *3/04*, *15/34*
U.S. Cl. 156—555 **2 Claims**

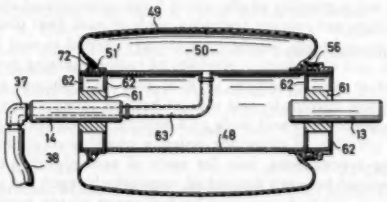


1. In a packing machine for processing superimposed webs of material which are to be sealed together along at least three laterally spaced lines extending longitudinally of the web, having anvil wheels one for each of said sealing lines, having laterally spaced sealing wheels one above each anvil wheel positioned to coact with the anvil wheels in exerting sealing pressure on the webs of material, and having a common shaft for said sealing wheels, the improvement comprising a pneumatic tire on each sealing wheel, and means providing for changes in the pneumatic pressure of each tire to compensate for dimensional or positional abnormatlities and insure the exertion of proper sealing pressure by each wheel on said webs relative to the other wheel, said means for providing for changes in the pneumatic pressure in each tire including air ducts in said shaft, a duct in each wheel communicating at one end with an air duct in said shaft and at its other end with the interior of its tire, and means for independently introducing air under pressure into each of the ducts of said shaft.

4,030,961
DEVICE FOR ASSEMBLING GLASS SHEETS AND LAYERS OF PLASTIC MATERIAL

Franz-Josef Straeten, Aachen; Rudolf Pelzer, Herzogenrath; Karl-Josef Feiten, Wuerselen, all of Germany, and Wilhelm-Josef Stevens, Kirchrath, Netherlands, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed July 31, 1975, Ser. No. 600,826
Claims priority, application France, Aug. 14, 1974, 74.28189
Int. Cl.² B30B *3/04*, *9/22*
U.S. Cl. 156—580 **11 Claims**



1. Apparatus for the assembly of sheets of glass with sheets of plastic material comprising a pair of rollers between which a plurality of sheets pass, said rollers being provided with a hollow elastic covering with a length corresponding at least to

the width of the sheets to be assembled, said hollow elastic covering having an internal space for receipt of a fluid under pressure and inflation thereby, said elastic covering being elongated in the axial direction and mounted on a cylindrical drum by rim means affixed to respective ends of the covering, at least one of said rim means being movably adjustable longitudinally of said drum so that the shape of the covering can be modified to accommodate sheets of glass having different shapes of bends and curves.

4,030,962

HEAT TRANSFER PRESS

John Herman Fitzwater, Warwick, R.I., assignor to Fitzwater Engineering Company, Warwick, R.I.

Filed Feb. 26, 1976, Ser. No. 661,743
Int. Cl.[2] B44C *1/16;* **B30B** *5/02, 15/34*
U.S. Cl. 156—583 **3 Claims**

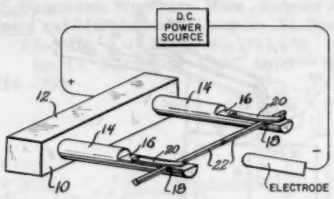
1. A heat transfer press comprising a table top having a plurality of clearance holes, a first sprocket and a second sprocket mounted in spaced relation to said table, a chain connecting said first sprocket with said second sprocket, drive means to rotate said first sprocket, said chain and said second sprocket, a left side rod and a right side rod, each mounted to said table top, two bearing left side pads slidably mounted to said left side rod, two bearing right side pads slidably mounted to said right side rod, four expandable air lift cylinders, each provided with a heat dissipating lug, fastened to said table top, a pneumatic connection to each of said four expandable air lift cylinders, a heated upper platen comprising a body having a face and a plurality of ribs which form a plurality of chambers therebetween, means fastening each of said heat dissipating lugs to said body, insulating material fastened to said body to close said chambers, a plurality of radiant heating tubes fastened in said chambers to heat said face, means applying electrical current to said radiant heating tubes, a plurality of rods fastened to said body and passing, respectively, through said plurality of clearance holes, a plurality of compression spring mechanisms, one for each of said plurality of rods, interposed between the end of, respectively, each rod and said table to yielding urge said heated upper platen toward said table top to compress said four expandable air lift cylinders, a cold lower platen, fastened to said two bearing left side pads and to said two bearing right side pads for movement into and out of register with said heated upper platen, and pneumatic means for cylically expanding said four expandable air lift cylinders.

4,030,963

ARC-MELTING PREPARATION OF SINGLE CRYSTAL LAB_6 CATHODES

Edwin D. Gibson, and John D. Verhoeven, both of Ames, Iowa, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 27, 1976, Ser. No. 652,695
Int. Cl.[2] B01J *17/10;* **C01B** *35/18;* **C01F** *17/00*
U.S. Cl. 156—602 **5 Claims**



1. A method for preparing single crystals of lanthanum hexaboride comprising:

mounting two rods of compacted lanthanum hexaboride powder by one end as a first electrode on an electrode holder electrically connected to the positive terminal of a DC electrical power source the opposite end of each rod being free, said two rods of lanthanum hexaboride being mounted slidably longitudinally on the electrode holder, the rods being on the same longitudinal axis, the free end of one rod contacting the free end of the other rod

striking an arc, under an inert atmosphere, at the point of contact between the rods with a second electrode electrically connected to the negative terminal of the power source;

increasing the power from the electrical source until a small zone of molten lanthanum hexaboride powder is formed at the space between the rods; and

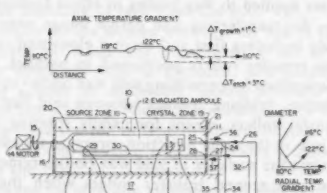
moving the second electrode slowly longitudinally along both rods, while maintaining the power constant, thereby forming a small moving zone of molten lanthanum hexaboride powder along the rods, to form a single rod of a single crystal of lanthanum hexaboride.

4,030,964

TEMPERATURE CYCLING VAPOR DEPOSITION HGI_2 CRYSTAL GROWTH

Michael M. Schieber; Israel Beinglass, and Giora Dishon, all of Jerusalem, Israel, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 29, 1976, Ser. No. 681,639
Int. Cl.[2] B01J *17/30;* **C01G** *13/04*
U.S. Cl. 156—610 **5 Claims**



1. A method for vapor phase growth of mercuric iodide

crystals consisting of the steps of positioning a rotatable ampoule containing a purified mercuric iodide source in one end thereof into a two-zone horizontal furnace, controlling the temperature in each of the zones of the furnace, oscillating the temperature of the source for causing growth and reevaporation of a crystal forming in the opposite end of the ampoule by directing airflows radially inwardly at separated places along the length of the ampoule and varying the volume of the airflows to provide controllably variable airflows along the length of the ampoule, directing a further airflow about the opposite end of the ampoule, rotating the ampoule, axially moving the first mentioned airflows during growth of a crystal at the opposite end of ampoule, varying the volume of the further airflow, and axially moving the further airflow during growth of a crystal in a direction away from the ampoule end opposite the movement of the axial airflows first mentioned airflows, thereby producing a sharper temperature gradient at the crystal growth interface and shortening the effective distance between the available source material and the interface.

4,030,965

CRYSTAL GROWTH PROCEDURE

David A. Hammond, Willoughby Hills, and Carl F. Swinehart, University Heights, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed June 9, 1976, Ser. No. 694,279

Int. Cl.² B01J *17/08;* **C01F** *11/20;* **C01D** *1/30, 3/20*

U.S. Cl. 156—616 R **9 Claims**

1. A method of growing a macrocrystal ingot of a material selected from the group consisting of an alkali metal halide and an alkaline earth metal halide in a Stockbarger furnace comprising placing a crucible charged with the salt into the furnace, heating the salt to melt the same and slowly growing the ingot under quiescent conditions with the growth commencing at the bottom of the crucible and moving upward, the improvement comprising melting down the salt while in contact with a gas composed primarily of helium, hydrogen or a mixture of the two at a reduced pressure of between 60 and 125 mm of mercury and thereafter growing the ingot from said melt in contact with an inert gas maintained at a higher pressure of at least five times that used during the meltdown.

4,030,966

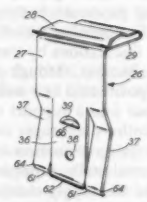
METHOD OF HYDROTHERMALLY GROWING QUARTZ

Carl F. Hornig, Kingston; Kenneth M. Kroupa, Lee, both of N.H., and Earle E. Simpson, Georgetown, Mass., assignors to Western Electric Company, Inc., New York, N.Y.

Filed June 27, 1975, Ser. No. 590,888

Int. Cl.² B01J *17/04;* **C01B** *33/12*

U.S. Cl. 156—623 Q **2 Claims**



1. In a method of hydrothermally growing a substantially stress-free quartz crystal from a planar quartz crystal seed plate having first and second major faces on opposite sides thereof, in which at least a portion of the seed plate adjacent one edge is inserted into and clamped in a supporting clip, and in which the seed plate is of a type which grows in thickness perpendicular to the plane of the seed plate, and in length and width from respective edges thereof in respective directions in the plane of the seed plate, the improvement which comprises the steps of:

clamping the major faces of the seed plate between first and second clamping fingers projecting from a body portion of the supporting clip, with each clamping finger engaging a respective one of the faces, at least one of the clamping fingers having a stress-relieving aperture formed therethrough of a small cross-sectional area in comparison to the cross-sectional area of the clamping finger and at least one of the clamping fingers including a projecting stop spaced from junctions of the first and second clamping fingers with the body portion, the stress-relieving aperture being essentially positioned intermediate the stop and a seed plate engaging end of the supporting clip;

limiting the extent to which the portion of the seed plate is inserted into the supporting clip between the first and second clamping fingers by engaging the one edge of the seed plate with the projecting stop so that the edge is spaced from the junctions of the first and second clamping fingers with the body portion of the supporting clip to permit substantially unobstructed stress-free growth of the quartz crystal from the edge in its respective direction in the plane of the seed plate; and

hydrothermally growing a portion of the major face of the quartz crystal seed plate which is engaged by the clamping finger having the stress-relieving aperture, through the stress-relieving aperture in the clamping finger in a direction perpendicular to the plane of the seed plate to reduce stress-cracking of the quartz crystal during the hydrothermal growing thereof.

4,030,967

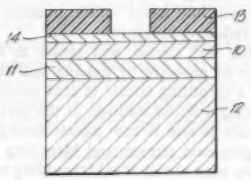
GASEOUS PLASMA ETCHING OF ALUMINUM AND ALUMINUM OXIDE

Sidney Ivor Joseph Ingrey, Alymer; Heinz Josef Nentwich, and Robert Gordon Poulsen, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 16, 1976, Ser. No. 714,631

Int. Cl.² C23F *1/02*

U.S. Cl. 156—643 **8 Claims**



1. A process for gaseous etching of aluminum and aluminum oxide, including an initial step of plasma etching in the presence of a gaseous trihalide comprising at least in part, a boron trihalide.

4,030,968

DISPOSAL OF PAPER PULP MILL SLUDGE

Krishan N. Goel, Grand Mere, and Osman J. Walker, St. Lambert, both of Canada, assignors to Consolidated-Bathurst Limited, Montreal, Canada

Continuation-in-part of Ser. No. 645,421, Dec. 30, 1975, abandoned. This application July 1, 1976, Ser. No. 701,611

Claims priority, application Canada, Dec. 22, 1975, 242540

Int. Cl.² D21C *3/22, 11/00;* **C02C** *5/10*

U.S. Cl. 162—16 **12 Claims**

8. A process suitable for the disposal of surplus sludge from a wood pulping process comprising the step of injecting said surplus sludge into the digestion step of the wood pulping process whereby said sludge is digested and a wood pulp is formed, a first portion of said digested sludge being retained as a part of the pulp yield, a second portion of said digested sludge being discharged as a ventable gas, and a third portion of said digested sludge being employed as a nutrient for the

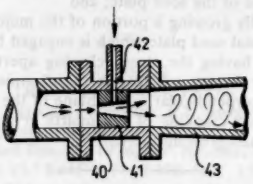
microbiological purification of spent pulping liquor effluent with an activated sludge.

4,030,969

METHOD OF DISPERSING A BLEACHING AGENT INTO A STREAM OF FIBROUS CELLULOSIC PULP MATERIAL IN A THROTTLING NOZZLE

Arne Johan Arthur Asplund; Rolf Bertil Reinhall, both of Lidingo, and Per Johan Ingemar Ahrel, Frovi, all of Sweden, assignors to Defibrator AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 369,298, June 12, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,221
Claims priority, application Sweden, June 13, 1972, 7776/72
Int. Cl.² D21B 1/12; D21C 9/10
U.S. Cl. 162—23 2 Claims



1. A method of admixing and dispersing a liquid solution of a bleaching agent into a stream of fibrous cellulosic pulp material comprising:

a. disintegrating fibrous cellulosic material in a defibrating zone in an atmosphere of steam above 100° C and at superatmospheric pressure to form a fibrous cellulosic pulp material;

b. passing a stream of the fibrous cellulosic pulp material together with the steam under pressure into a throttling zone of reducing pressure;

c. subjecting said stream and steam to an instantaneous reduction of pressure by passing said stream and steam through a throttling nozzle in said throttling zone;

d. introducing a liquid solution of the bleaching agent into said stream as said stream passes through said nozzle;

e. discharging said stream and bleaching solution into an expansion zone ahead of said throttling nozzle to enhance dispersion of the bleaching agent into the fibrous cellulosic pulp material; and then

f. passing the fibrous cellulosic pulp material to a collection zone.

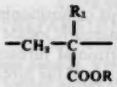
4,030,970

SURFACE SIZING OF PAPER WITH AN ACRYLIC COPOLYMER WHERE SCUM FORMATION IS MINIMIZED

Yoichi Tominaga, Muko, and Yasuo Shibahara, Kyoto, both of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

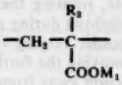
Filed May 30, 1974, Ser. No. 474,544
Claims priority, application Japan, May 31, 1973, 48-61503
The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.
Int. Cl.² D21H 3/44
U.S. Cl. 162—168 R 14 Claims

1. A process for surface-sizing paper which comprises applying to the surface of the paper a surface sizing composition for paper which forms substantially no scum in a surface sizing press operation even after 8 hours, which composition comprises a copolymer having copolymerized acrylic or methacrylic ester units (A) of the formula (1):



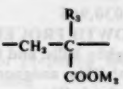
(1)

wherein R_1 is H or methyl, and R is a hydrocarbon radical having 1-18 carbon atoms, copolymerized acrylic or methacrylic acid alkali metal salt units (B) of the formula (2):



(2)

wherein R_2 is H or methyl and M_1 is an alkali metal and copolymerized acrylic or methacrylic acid salt units or acid units (C) of the formula (3):



(3)

wherein R_3 is H or methyl, and M_2 is ammonium or a combination of ammonium with a lower alkyl amine cation and/or H, wherein said copolymer has a carboxylic equivalent of 90–500 in the free carboxylic form and a molar ratio of units (B) to (C) of 5–50:95–50.

4,030,971

SYSTEM COMPENSATING FOR PRESSURE FLUCTUATIONS IN A PAPER MACHINE HEADBOX

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 532,647, Dec. 13, 1974, abandoned. This application Oct. 29, 1975, Ser. No. 626,824
Int. Cl.² D21F 1/06
U.S. Cl. 162—216 18 Claims

12. The method of dampening pressure surges in a supply system for conducting paper stock through a stock conduit under pressure to a slice opening which comprises:

absorbing pressure fluctuations by transmitting the fluctuations to an air chamber through a diaphragm wall of flexible material positioned as a wall of the stock conduit;

dividing the chamber into a support compartment directly exposed to the entire diaphragm and a supply compartment with an air flow attenuation wall between the compartments and continually supplying air at a predetermined pressure to the supply compartment.

4,030,972

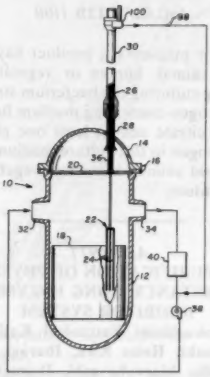
FLUIDLY DRIVEN CONTROL ROD

Malcolm Duane Groves, Suffield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 22, 1974, Ser. No. 463,011
Int. Cl.² G21C 7/08
U.S. Cl. 176—36 R 9 Claims

1. In a nuclear reactor including a reactor vessel and a neutron absorber for vertical reciprocation in said vessel, a neutron absorber actuator assembly comprising:

a. a housing extending upward from said vessel and including an actuator cylinder extending vertically therewithin;
b. a piston rod drivingly connected to said neutron absorber and extending thereabove and including a head portion near the upper end thereof and sized for free movement within said cylinder between raised and lowered positions;
c. piston means freely encircling said piston rod below said head portion for longitudinal movement relative thereto and sized to engage the undersurface of said piston rod head portion and to have a larger diameter than said



piston rod head portion for close sliding relation with the wall of said cylinder;
d. a fluid source operatively connected to said actuating cylinder for selectively applying a net upward force to said piston to raise said piston and piston rod to said raised position; and
e. means for latching said piston rod comprising a selectively energizable electromagnet means associated with said housing and a part of said piston rod made of magnetic material so positioned with respect to said electromagnet means as to megnetically latch said piston rod in said raised position.

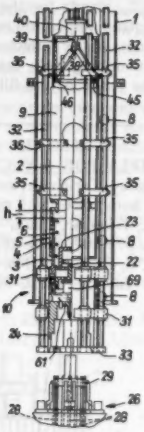
4,030,973

GRIPPING DEVICE, ESPECIALLY FOR USE IN MANIPULATING CONTROL BARS IN A NUCLEAR REACTOR

Bernhard Hoffmeister, Wilhelmshaven, and Gerhard Dose, Laudenbach, Bergstrasse, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed July 2, 1974, Ser. No. 485,264
Int. Cl.² G21C *7/08*
U.S. Cl. 176—36 R **8 Claims**

1.
a. A device in combination for gripping alternatively elongated control rods, or fuel elements;
b. a gripper body which is guided within a guiding post for movement in vertical direction;
c. a rod head gripping tool which — interchangeable for a fuel element gripping tool — is detachably connected to the lowr end of said same gripper body;
d. said rod head gripping tool being provided at its lower end with a clutch device for detachably connecting this rod head gripping tool and a head bar to which the upper ends of said elongated rods of a bundle are fastened therewith;
e. a plate positioned below said clutch device and having a perforation through which said head bar and the rods connected thereto can pass with small clearance around the rods; said plate radially confining said rods when in surrounding relation thereto;
f. a plurality of separate straight guide members fastened each with one lower end to said plate and extending upwardly therefrom in parallel spaced relationship in such arrangement that said guide members define a space within which said gripper body and said rod head gripping tool can be moved in vertical direction;
g. guiding means seated on said rod head gripping tool slidably engage said guide members;



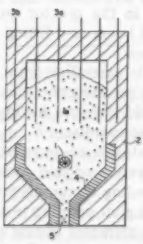
h. at least two independently operable catch means spaced along the longitudinal axis of and connected to said guide members near the upper ends thereof; the difference of said spacing corresponding to the possible difference of length of said elongated rods;
i. and latch elements supported by said gripper body which can be adjusted into a first position in which said latch elements reach under said catch means and into a second position in which they freely pass said catch means; and means within said gripper body for selectively operating said latch elements, said means controlling the engagement of said gripper tool to said gripper body.

4,030,974

CORE REACTOR

Hanns-Joachim Neef, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Sept. 9, 1974, Ser. No. 504,535
Claims priority, application Germany, Sept. 8, 1973, 2345431
Int. Cl.² G21C *3/26*
U.S. Cl. 176—58 PB **3 Claims**



1. A ball-pile reactor having a fill of elements selected from

the group consisting of fuel and breeder elements which pass through said reactor with a cooling medium from a charging side in a dump material layer, an absorber rod arrangement including control rods that directly engage said elements, said control rods being movable into said fill from the charging side in the pass-through direction of the elements, said reactor comprising a reflector of graphite having the graphite of its wall below the range of movement of said control rods doped with a substance constituting a neutron poison selected from the group consisting of hafnium, boron, and other elements having a neutron cross section Σ_a (in cm.$^{-1}$) such that $e^{-\Sigma a \cdot d} \leq 10^{-3}$, in which Σ_a stands for the macroscopic effective cross section for neutron absorption measured in cm.$^{-1}$, and d stands for the thickness of the reflector wall measured in cm., said neutron poison doping only that part of the reflector which surrounds the range of the fill not penetrated by the control rods.

4,030,975

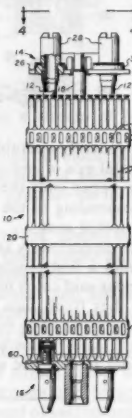
FUEL ASSEMBLY FOR A NUCLEAR REACTOR

Andrew James Anthony, Tariffville, and John Jefferson Hutchinson, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 373,207, June 25, 1973. This application Oct. 6, 1975, Ser. No. 619,560

Int. Cl.[2] G21C *3/30*

U.S. Cl. 176—78 **6 Claims**



1. An improved nuclear fuel assembly of the type having a plurality of elongated fuel elements supported in a generally parallel array by fuel support structures which are rigidly attached to vertically extending hollow structural members at least one of which is in turn connected to upper and lower end fittings, said upper and lower end fittings including upper and lower end plates respectively, and means for alignment of the fuel assembly within a reactor core comprising at least one vertically extending post, adapted to slidably engage corresponding openings in the reactor core structure, extending from the upper and lower end fitting plates, wherein the improvement comprises:

a threaded spindle extending from said at least one vertically extending post to penetrate an aperture in said end fitting plate, said aperture having substantially the same diameter as said spindle;

a shoulder on said at least one vertically extending post to limit the penetration of said spindle;

an inwardly extending flange on one end of said structural member defining an opening in said end having substantially the same diameter as said spindle; and

a nut, disposed in the interior of said structural member and retained therein at said one end of said member by said inwardly extending flange, said nut threadably engaging said threaded spindle to clamp said flange between said nut and said end fitting plate.

4,030,976

PROCESS FOR PREPARING A PRODUCT HAVING A BIOLOGICAL ACTIVITY

Roger Paul, Beaumont en Auge, France, assignor to Etablissement Ani, chez Me Beck, avocat, Vaduz, Liechtenstein

Filed Dec. 15, 1975, Ser. No. 640,800

Claims priority, application Switzerland, Jan. 8, 1975, 129/75

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—29 **7 Claims**

1. A process for preparing a product having a biological activity towards animal, human or vegetable tissue to be treated comprising culturing the bacterium strain NCIB 11144 in a nutritious nitrogen-containing medium further containing ammoniacal iron citrate and at least one phosphate with a portion of the nitrogen in this culture medium being provided by the tissue of said animal, human or vegetable tissue to be treated by the product.

4,030,977

METHOD FOR PURIFICATION OF PHYSIOLOGICALLY ACTIVE SUBSTANCE USING ENZYME-ENZYME INHIBITOR SYSTEM

Setsuro Fujii, Tokushima; Yasumichi Kajita, Kyoto; Seizi Hiraku, Takatsuki; Heizo Kira, Ibaragi; Hideki Aishita, Takatsuki; Keiko Muryobayashi, Ibaragi; Hiroshi Terashima, Takatsuki; Akira Akimoto, Osaka; Ken Taniguchi, Higashinose, and Minoru Wada, Kishiwada, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 426,143, Dec. 19, 1973, abandoned. This application Mar. 19, 1976, Ser. No. 668,378

Claims priority, application Japan, Dec. 19, 1972, 47-127396

Int. Cl.[2] C12D *13/10*

U.S. Cl. 195—66 R **4 Claims**

1. A method for isolating and purifying kallikrein contained in mammalian tissue or body fluid which comprises contacting an extract of said tissue or said body fluid with a material formed of an insoluble carrier chemically coupled to a proteolytic enzyme inhibitor for kallekrein, said material being selected from an insolubilized naturally occurring enzyme inhibitor so as to bind said kallikrein and eluting said kallikrein therefrom using first 0.1 M acetate buffer of pH 4.0 and second 0.1 N acetic acid solution and immediately adding the eluate drop-wise to 2M Tris-amino-methane HCl buffer of pH 8.0 to 10.0, wherein said process is carried out by contacting said extract of said tissue or said body fluid with insoluble carrier chemically coupled to soybean trypsin inhibitor and then with insoluble carrier chemically coupled to bovine lung trypsin inhibitor.

4,030,978

NOVEL ASSEMBLY, COMPOSITIONS AND METHODS

Irwin J. Abramson, Baltimore, Md., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed July 29, 1976, Ser. No. 709,661

Int. Cl.[2] C12K *1/04*

U.S. Cl. 195—75 **12 Claims**

1. An assembly for maintaining anaerobic, aerobic or facultative microorganisms, which comprises;

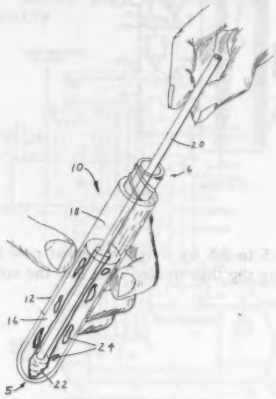
a tubular container having a first, hermetically sealed end and a second end hermetically sealed with a removable closure, said container with said closure defining a collection chamber;

a composition partially filling said collection chamber, said composition comprising, in parts by weight,

1,000 parts ion free water

0.01–0.5 parts oxygen indicator

1.8–2.2 parts sodium phosphate, tribasic
0.9–1.1 parts potassium phosphate, dibasic
0.09–0.11 parts calcium chloride
0.09–0.11 parts magnesium chloride hexahydrate
7.5–8.5 parts sodium chloride
0.5–1.5 parts sodium thioglycolate



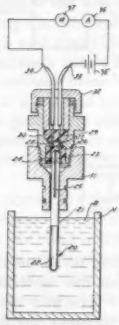
0.5–1.5 parts cysteine hydrochloride
5–20 parts agar;
said composition having a consistency of from about 170–350 grams/cm² and having a pH of 6.9–7.8;
the remaining portion of said chamber being filled with an oxygen free gas.

4,030,979

METHOD OF DETECTING HYDROGEN-PRODUCING BACTERIA

Walter Henry Zuber, Stowe, Vt., assignor to Walter H. Zuber, Jr., Stowe, Vt.

Filed Dec. 10, 1975, Ser. No. 639,457
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 M **12 Claims**



1. A method of detecting the presence of bacteria capable of producing hydrogen in a liquid culture medium which comprises the following steps:

a. qualitatively and quantitatively detecting hydrogen by subjecting the liquid culture medium to a hydrogen-sensing device;

b. qualitatively and quantitatively redetecting hydrogen by resubjecting the liquid culture medium to the hydrogen-sensing device of step (a) sometime thereafter; and

(c) relating any change in the hydrogen concentration to bacterial content.

4,030,980

APPARATUS AND METHOD FOR IDENTIFICATION OF SELECTED CLINICAL YEAST

Orville A. Beckford, Port Washington, and Helen F. B. Dauzickas, Babylon Village, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 15, 1975, Ser. No. 577,799
Int. Cl.² C12K *1/10*
U.S. Cl. 195—139 **17 Claims**

1. Apparatus to grow and identify a number of isolated cultures including:

a plate including a plurality of discrete spaced wells defined by substantially vertical walls and an integral bottom wall,

a cover member disposed on said plate sealing the individual tops of said wells; and,

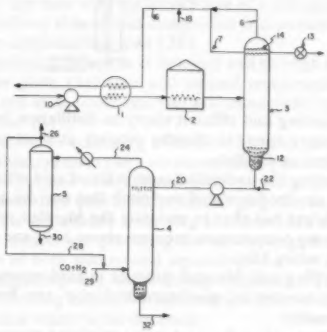
aperture means extending through a said vertical wall in communication with a respective one of each of said wells to expose the same to atmospheric air whereby a number of isolated cultures may be concomitantly grown.

4,030,981

PROCESS FOR MAKING OIL FROM AQUEOUS REACTIVE SLUDGES AND SLURRIES

Howard V. Hess, Glenham; William F. Franz, Gardiner, and Edward L. Cole, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,967
Int. Cl.² C10B *53/02, 57/04, 57/06;* **C10G** *1/00*
U.S. Cl. 201—2.5 **3 Claims**



1. A process for making low sulfur oil from an aqueous charge containing cellulose and other carbohydrates comprising coking said charge at a temperature in the range of 400° to 550° F under a pressure of 300 to 1200 psig for 5 minutes to 2 hours to form an aqueous slurry containing coked solids; removing from 50 to 99 percent of the liquid from said slurry; contacting the thus concentrated slurry with hot pressurized carbon monoxide at a pressure of between about 500 to 5000 psig at a temperature of between 500° and 750° F to form a low sulfur oil, gases and carbon and inorganic solids and separating said oil from said carbon and inorganic solids and gases.

4,030,982

PROCESS OF MAKING FORMCOKE FROM NON-CAKING OR WEAKLY CAKING COALS

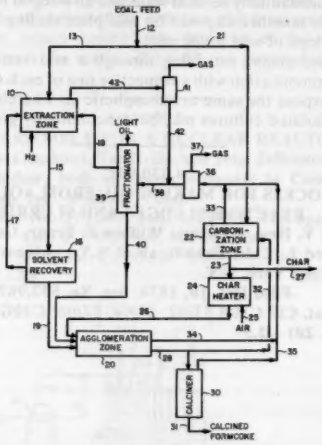
Everett Gorin, Pittsburgh; William A. Jasulaitis, Bridgeville; Frank W. Theodore, Pittsburgh, and George E. Wasson, Eighty-Four, all of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed July 10, 1975, Ser. No. 594,906
Int. Cl.² C10B *53/08, 55/00*
U.S. Cl. 201—6 **4 Claims**

1. In the process of making formcoke from a normally non-caking or weakly caking coal wherein a mixture of carbo-

naceous solids and carbonaceous binder derived from said coal is tumbled under adiabatic conditions at an elevated temperature in a rotary kiln adapted to rotate about its longitudinal axis, to thereby form agglomerates having a predetermined size which are thereafter calcined to produce formcoke suitable for use in a blast furnace, the improvement comprising:

a. subjecting said coal, in a finely divided state, to solvent extraction in a solvent extraction zone in the presence of hydrogen under extraction conditions to thereby produce a product consisting of an effluent gas and an effluent slurry;



b. subjecting said effluent slurry to distillation in a solvent recovery zone, to thereby recover at least part of the solvent as distillate;

c. blending the undistilled remainder of said effluent slurry and any feed coal and any pitch that may be added, with sufficient hot char to maintain the blended product at a forming temperature between about 385° and 475° C. in said rotary kiln;

d. tumbling said blended product in said rotary kiln until agglomerates of predetermined size are formed; and thereafter

e. heating said agglomerates in a calcining zone until formcoke is produced which is suitable for use in a blast furnace.

4,030,983

METHOD OF RESTRICTING DUST DEVELOPMENT WHEN FEEDING COAL INTO COKE OVENS

Kurt Günther Beck; Wolfgang Rohde; Diethard Habermehl, and Werner Siebert, all of Essen, Germany, assignors to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Germany

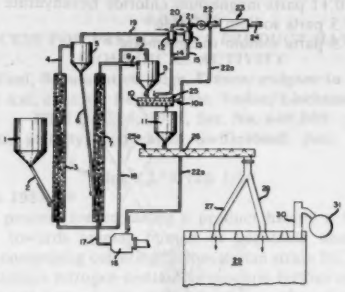
Continuation-in-part of Ser. No. 646,751, Jan. 6, 1976. This application Apr. 5, 1976, Ser. No. 673,895

Claims priority, application Germany, Apr. 4, 1975, 2514859

Int. Cl.² C10B *53/04, 55/02*

U.S. Cl. 201—23 **12 Claims**

1. A process for producing coke from preheated coal whereby the amount of coal dust and the risk of explosion are reduced, comprising preheating the coal to a temperature between about 150° and 250° C, thereafter mixing the coal



with about 0.5 to 3% by weight of moist coal tar and then gravity-pouring the thus-treated coal into the coke oven.

4,030,984

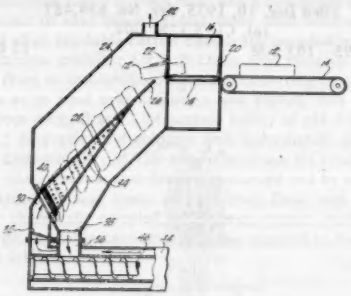
SCRAP-TIRE FEEDING AND COKING PROCESS

Ren W. Chambers, Newport Beach, Calif., assignor to Deco Industries, Irvine, Calif.

Filed June 12, 1975, Ser. No. 586,265

Int. Cl.² C10B *47/20, 51/00, 57/04, 57/08*

U.S. Cl. 201—25 **5 Claims**



1. A process of feeding scrap tires into a reactor for the recovery of carbonaceous raw materials comprising:

suspending the intact tires in a melt chamber on a cone shaped suspending member, the hollow center portion of said tires being positioned over the apex of said cone shaped member and

said tires moving down said member during melting, said chamber having substantially inert hot gases flowing therethrough;

allowing the hot gases to flow past said tires melting the carbonaceous material;

feeding the melted carbonaceous material into a reactor tube which converts the material to volatile hydrocarbons;

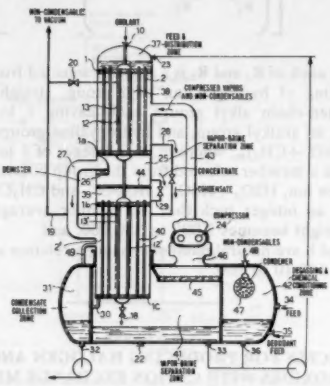
collecting in the melt chamber the non-meltable portions of the scrap tires.

4,030,985

APPARATUS FOR DESALTING SALINE WATER

Diego Barba; Antonino Germanà; Giuseppe Liuzzo, and Giovanni Tagliaferri, all of Rome, Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 17, 1975, Ser. No. 641,474
Claims priority, application Italy, Dec. 20, 1974, 30811/74
Int. Cl.² B01D 3/02, 3/00, 1/26
U.S. Cl. 202—174 7 Claims



1. An apparatus for desalting saline water, which comprises:

a vertical elongated tubular shell closed at its upper end by a domed end-wall and at its lower end by a lower header plate (1c);

said shell defines together with said end-wall and an upper header plate (1) an upper zone (37) for the feeding and distribution of the saline water to be desalted; said upper zone (37) providing a pool of saline water fed in through a pipe (23);

said shell defines with said upper header plate (1) and an upper intermediate header plate (1a) first evaporation and condensation zones (38); a first bundle of vertical tubes (2) extends through said condensation zone (38), the upper ends of said tubes protruding through said upper head plate (1), being submerged in said pool of said upper zone (37) and being provided with means for flowing in the inside of the tubes (2) saline water in the form of a thin falling film; the lower ends of said tubes (2) protruding through said upper intermediate header plate (1a) in a first separation zone (25) for the separation of vapor from the residual brine; said first condensation zone (38) includes a vertical tubular collector (13) for the uncondensable gases, said collector (13) being foraminous in its lower part, provided on the inside with cooling means and connected at its upper part to a suction equipment;

said first separation zone (25) for the separation of vapor from the brine is defined by said shell, said upper intermediate header plate (1a) and a lower partition plate (44);

said partition plate (44) defines with the shell and a lower intermediate header plate (1b) a lower feeding and distribution zone (39) providing a pool of saline water;

said lower intermediate header plate (1b) defines with said shell and said lower header plate (1c) a second evaporation and condensation zone (40); a second bundle of vertical tubes (2') extends through said second evaporation and condensation zone (40), the upper ends of said second bundle of vertical tubes tubes (2') protruding through said lower intermediate header plate (1b) being submerged in said pool in said lower feeding and distribution zone (39) and being provided with means for flowing in the inside of said tubes (2') saline water in the form of a falling and thin film; the lower ends of said second bundle of vertical tubes tubes (2') protruding through said lower header plate (1c) in a second separation zone (41) for the separation of vapor from the residual brine; said second evaporation and condensation zone (40) includes a vertical tubular collector (13') for the uncondensable gases, said collector (13') being foraminous in its lower part, provided on the inside with cooling means and connected at its upper part to a suction equipment;

said first separation zone (25) and said lower feeding and distribution zone (39) are connected by means of a pipe (24) for delivering said brine collecting in said first separation zone (25) to said pool of said lower feeding and distribution zone (39);

said first and second condensation zones (40) are connected by means of a pipe (28) for delivering the condensate collecting in said first condensation zone (38) to said second condensation zone (40);

said first separation zone (25) and said second condensation zone (40) are connected by means of a pipe (27) for delivering, through a demister (26) housed in the upper part of said first separation zone (25), said vapor recovered in said first separation zone (25) to said second condensation zone (40);

said shell is supported by a base section comprising a horizontal closed-ended vessel having a pair of inner impervious vertical partitions; said partitions define in said vessel a collecting chamber (31) for the condensate at one end of the vessel, a degassing and conditioning chamber (42) for the feeding saline water at the other end of the vessel, and said second separation zone (41) extending between the partitions; the lower portion of said shell protrudes in sealing contact with said vessel into said zone (41);

said second separation zone (41) is connected through an upper aperture with the intake side of a compressor and the delivery side of said compressor is connected to said upper condensation zone (38);

a downcomer tube opens at its upper end through the lower header plate (1c) into said second condensation zone (40) and at its lower end into said condensate collecting chamber (31);

said condensate collecting chamber (31) and said second condensation zone (40) are connected by a conduit (49) for the purpose of equilibrating the pressures therein;

pump means are provided for discharging the condensate from the condensate collecting chamber (32) and other pump means are providing for connecting the bottom region of both said second separating chamber (41) and said degassing and conditioning chamber (42) to said upper feeding zone (37) to thereby deliver to the latter the saline water to be desalted.

4,030,986

CONTROL FOR MAXIMIZING CAPACITY AND OPTIMIZING PRODUCT COST OF DISTILLATION COLUMN

Francis G. Shinskey, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed May 14, 1975, Ser. No. 577,497
Int. Cl.² B01D 3/42
U.S. Cl. 203—2 23 Claims

1. The method of maximizing capacity and optimizing product cost of a distillation column which utilizes a reflux condenser that receives and condenses overhead fluids from the column to maintain the operating pressure in the column at a minimum value, which method comprises:

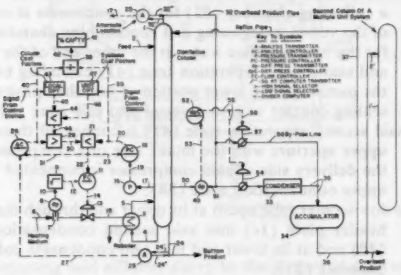
1. producing a flow control signal and utilizing that control signal to regulate the rate of flow of heating medium to said column to maintain said rate at a preselected set-point value;

2. producing a pressure control signal which is inversely proportional to said operating pressure and utilizing that control signal to modify said rate in a direction to increase said rate when said operating pressure is below a preselected set-point value representative of a safe maxi-

mum limit and to decrease said rate when said operating pressure exceeds said set-point value;

3. producing a purity control signal which is proportional to the purity of a product of said column and utilizing that signal to modify said rate in a direction to increase said rate when said purity is below a preselected set-point value representative of a minimum acceptable purity value and to decrease said rate when said purity is above said set-point value;
4. producing a cost factor control signal which is a function of cost factors relating to the production of said product and utilizing that control signal to modify said rate in a direction to optimize said product cost;
5. utilizing only one of said latter three named control signals at any time to modify said rate by a selective process wherein said purity control signal is compared with cost factors control signal and the higher of these control signals is selected and compared with said pressure control signal and the lower of these latter compared control signals is utilized to modify said rate, whereby

only said cost factor control signal will be selected utilized to modify said rate when that control signal exceeds said purity control signal but is less than said pressure control signal and



will modify said rate to maintain said rate at a value that will result in optimizing the product cost during such time as said purity exceeds said set-point value representative of a minimum acceptable purity value and said operating pressure is below said set-point value representative of said safe maximum limit,

only said purity control signal will be selected to modify said rate when that control signal is below said set-point value representative of said minimum acceptable purity value and will increase said rate to return said purity to said minimum acceptable value during such time as said operating pressure is below said set-point value representative of said safe maximum limit, and

only said pressure control signal will be selected to modify said rate when the operating pressure exceeds said set-point value representative of said safe maximum limit and will reduce said rate to return said operating pressure to said safe maximum limit; and

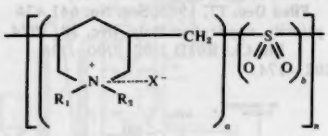
6 producing a velocity control signal which is proportional to the velocity of fluids flowing in said column and utilizing that control signal to reduce said velocity when the value of said velocity exceeds a set-point value representative of approaching flooding conditions to thereby prevent flooding from occurring.

4,030,987
ZINC PLATING METHOD

Shigeru Fujita, Omiya; Koichi Murayama, Tokyo, and Toyohito Kaneda, Yono, all of Japan, assignors to Kabushiki Kaisha Japan Metal Finishing Company, Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,695
Claims priority, application Japan, Mar. 8, 1975, 50-28191
Int. Cl.² C25D *3/22*
U.S. Cl. 204—55 R **6 Claims**

1. In a zinc plating method which comprises carrying out electrodeposition in an aqueous alkaline zinc plating bath, the improvement comprising adding to said bath a brightening effective amount of an aromatic aldehyde and a polyamine sulfone represented by the formula



where: each of R_1 and R_2 is a member selected from the group consisting of hydrogen, an allyl group, straight-chain and branched-chain alkyl groups each having 1 to 16 carbon atoms, an aralkyl group, and hydroxyalkyl groups of the formula $HO-(CH_2)_m$, where m is an integer of 1 to 6;

X^- is a member selected from the group consisting of halogen ion, HSO_4^-, HSO_3^-, $HCOO^-$, and CH_3COO^-;

n is an integer such that the number average molecular weight becomes 2,000 to 350,000; and

a and b are natural numbers having a relation such that $a:b$ = 100:10 to 100.

4,030,988
PROCESS FOR PRODUCING HALOGEN AND METAL HYDROXIDES WITH CATION EXCHANGE MEMBRANES OF IMPROVED PERMSELECTIVITY

Walther Gustav Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 425,079, Dec. 17, 1973, Pat. No. 3,969,285. This application Apr. 27, 1976, Ser. No. 680,873
Int. Cl.² C25B *1/16*
U.S. Cl. 204—98 **2 Claims**

1. In a process of production of halogen and metal hydroxide of an alkali or alkaline earth metal, or combination thereof, by electrolysis of a halide of said metal employing anode and cathode sections separated by an ion exchange film, said improvement comprising passing ions of said metal through a fluorinated ion exchange polymer film comprising

a. a first surface formed from an intermediate fluorinated polymer containing pendant sulfonyl halide groups attached to carbon atoms which have at least one fluorine atoms connected thereto in which

i. at least 40% of the sulfonyl halide groups to a depth of at least one micron in the intermediate polymer have been reacted with a di- or poly-amine comprising at least two groups with one primary amine groups and a second amino group either primary or secondary, said first surface facing the cathode section; and

ii. the polymer of (i) has been subjected to an elevated temperature of between 170° C. and the degradation temperature of the reacted polymer for a period of time to increase permselectivity;

b. a second surface containing pendant sulfonyl groups attached to carbon atoms which have at least one fluorine atom connected thereto with at least a majority of the sulfonyl groups present as $-(SO_2NH)_MQ$, or $-(SO_3)_nMe$ wherein Q and Me represent ions of said metal, and m and n represent the valence of said metal.

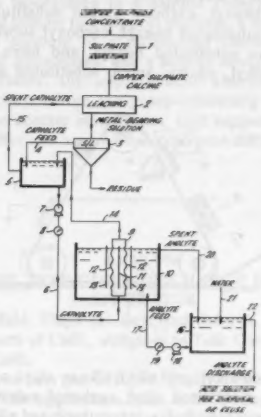
4,030,989
ELECTROWINNING PROCESS

Milton Graham Montgomery Atmore, and Roy Duncan Macpherson, both of Johannesburg, South Africa, assignors to Anglonor S. A., Luxembourg, Luxembourg

Filed May 11, 1976, Ser. No. 685,148
Int. Cl.² C25B *1/22*; C25C *1/08*, *1/12*, *1/11*
U.S. Cl. 204—104 **17 Claims**

1. A process for the recovery of a metal from a sulphurous feed material containing the metal, which process comprises

leaching the sulphurous feed material with an aqueous leach solution to form an aqueous metal-bearing solution containing sulphate ions and ions of the metal; removing solids from the metal-bearing solution; and thereafter electrowinning the metal from the metal-bearing solution in an electrolytic cell having an anode compartment containing an anode and a cathode compartment containing a cathode, said compartments being separated by an ion-permeable, substantially



fluid-impermeable membrane, by flowing the metal-bearing solution through the cathode compartment and flowing an aqueous acidic anolyte through the anode compartment, a potential difference being maintained between the anode and the cathode so as to electrodeposit ions of the metal from the metal-bearing solution onto the cathode and to cause the passage of sulphate ions through the membrane from the cathode compartment to the anode compartment.

4,030,990
PROCESS FOR RECOVERING ELECTROLYTIC COPPER OF HIGH PURITY BY MEANS OF REDUCTION ELECTROLYSIS

Norbert L. Piret; Hans Joachim Rabben; Herbert Kudelka, all of Duisburg, and Siegbert Schmidt, Moers-Vinn, all of Germany, assignors to Duisburger Kupferhutte, Duisburg, Germany

Filed June 22, 1976, Ser. No. 698,558

Claims priority, application Germany, Oct. 30, 1975, 2548620

Int. Cl.² C25C *1/12*

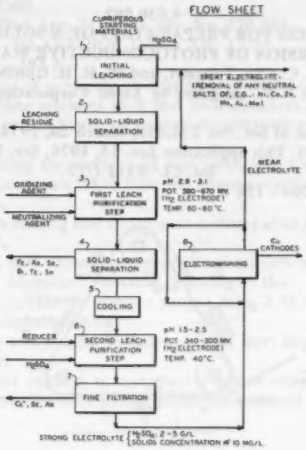
U.S. Cl. 204—108 **33 Claims**

1. Process for producing high purity electrolytic copper with an electric conductivity of at least 58.8 mho × m/mm², and a maximum semi-hard temperature of 200° C by reduction electrolysis of a copper sulphate solution obtained by sulphuric acid leaching of crude cupriferous materials and containing in solution impurities which interfere with the electrolysis, characterized in that prior to the electrolysis the copper sulphate solution is subjected to purification to at least partially remove said impurities, comprising:

a first step in which the copper sulfate solution is maintained at a pH of 2.7–3.3, and a potential of at least 575 mv in relation to the standard hydrogen electrode for precipitation of part of said impurities, and the precipitated impurities are removed from the solution, and

a second step in which the potential of the solution is reduced for formation of copper (I) compounds of at least part of the remaining impurities and precipitation of said copper (I) compounds, and the precipitated copper (I) compounds are removed from the solution,

and electrolyzing solution subjected to said first and second steps to produce said high purity electrolytic copper.



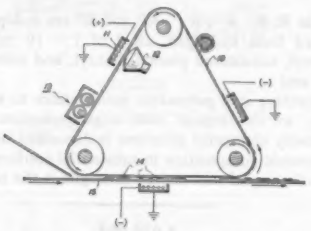
4,030,991
PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS

Joseph Y. C. Chu, Fairport, and W. H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 454,896, March 26, 1974, Pat. No. 3,994,791. This application Jan. 15, 1976, Ser. No. 649,443

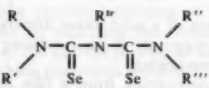
Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 R **1 Claim**



1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix comprising:

a. forming a polymeric composition from a film forming insulating polymeric resin and at least one organoselenium compound of the formula



wherein

R, R', R'', R''' and R^{iv} are independently selected from hydrogen, alkyl, of 1 – 10 carbon atoms, phenyl, substituted phenyl, benzyl and substituted benzyl; and

b. subjecting said polymeric composition to sufficient energy to decompose said organoselenium compound whereby elemental selenium is deposited within the organic polymeric composition in substantial conformity

with the distribution of said energy throughout the composition.

4,030,992

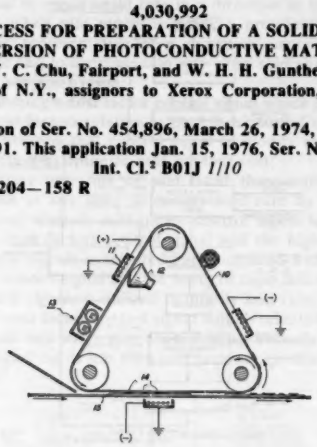
PROCESS FOR PREPARATION OF A SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS

Joseph Y. C. Chu, Fairport, and W. H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 454,896, March 26, 1974, Pat. No. 3,994,791. This application Jan. 15, 1976, Ser. No. 649,446

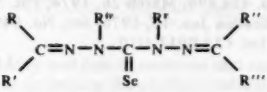
Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 R **1 Claim**



1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix comprising:

a. forming a polymeric composition from a film forming insulating polymeric resin and at least one organoselenium compound of the formula



wherein R, R′, R″, R‴, R^{iv} and R^{v} are independently selected from hydrogen, alkyl of 1 – 10 carbon atoms, phenyl, substituted phenyl, benzyl, and substituted benzyl; and

b. subjecting said polymeric composition to sufficient energy to decompose said organoselenium compound whereby elemental selenium is deposited in the organic polymeric composition in substantial conformity with the distribution of said energy throughout the composition.

4,030,993

PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS

Joseph Y. C. Chu, Fairport, and W. H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

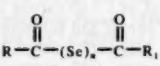
Division of Ser. No. 454,896, March 26, 1974. This application Jan. 15, 1976, Ser. No. 649,385

Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 R **1 Claim**

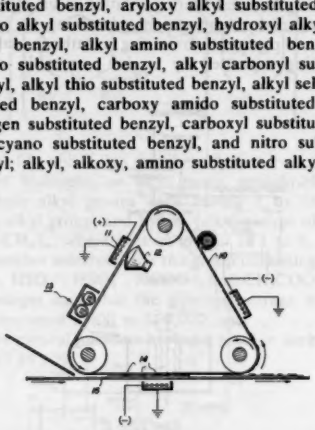
1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix, said process comprising:

a. forming a polymeric composition from a film forming insulating polymer resin and at least one organo-selenium compound of the formula



wherein

R and R_1 are independently selected from the group consisting of benzyl, alkyl substituted benzyl, alkoxy substituted benzyl, acryl substituted benzyl, amino substituted benzyl, amido substituted benzyl, arylalkyl substituted benzyl, aryl substituted benzyl, alkoxy alkyl substituted benzyl, aryloxy alkyl substituted benzyl, amino alkyl substituted benzyl, hydroxyl alkyl substituted benzyl, alkyl amino substituted benzyl, aryl amino substituted benzyl, alkyl carbonyl substituted benzyl, alkyl thio substituted benzyl, alkyl seleno substituted benzyl, carboxy amido substituted benzyl, halogen substituted benzyl, carboxyl substituted benzyl, cyano substituted benzyl, and nitro substituted benzyl; alkyl, alkoxy, amino substituted alkyl, amido



substituted alkyl, aryl alkyl, alkoxy alkyl, aryloxy alkyl, hydroxy substituted alkyl, carbonyl substituted alkyl, thio substituted alkyl, seleno substituted alkyl, carboxy, amino substituted alkyl, halogen substituted alkyl, carboxy substituted alkyl, cyano substituted alkyl, and nitro substituted alkyl; cyclo alkyl and substituted cyclo alkyl; heterocyclic radicals; and acyl radicals; and

n is 1 or 2.

b. subjecting said polymeric composition to sufficient energy to decompose said organoselenium compound whereby elemental selenium is deposited in the organic polymeric composition in substantial conformity with the distribution of said energy throughout the composition.

4,030,994

SUBSTITUTIVE FLUORINATION OF ORGANIC COMPOUNDS

Janos Kollonitsch, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 154,695, June 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 60,645, Aug. 3, 1970, abandoned. This application Oct. 9, 1973, Ser. No. 404,555

Int. Cl.² C08F *2/46, 2/54, 8/00*

U.S. Cl. 204—159.11 **8 Claims**

1. A process for the substitutive fluorination of an organic compound containing at least one replaceable hydrogen atom, wherein the organic compound is either unsubstituted or substituted and is selected from the group consisting of

1. mono- and polynuclear carbocyclic aromatic compounds,
2. mono- and polynuclear alicyclic compounds,
3. alkanes and alkenes,
4. amino acids,
5. fatty acids,
6. polymers, and
7. heterocycles

which comprises contacting the organic compound in the liquid or solid state with a reagent selected from the group consisting of a fluoroxy perfluoroalkane of 1–5 carbon atoms and fluoroxy pentafluorosulfur in the presence of a free radical initiator which is light or ionizing radiation.

4,030,995
ALKALINE PHOSPHATASE ISOENZYME DETERMINATION

William H. Starkweather, Oakville, Mo., assignor to Sigma Chemical Company, St. Louis, Mo.

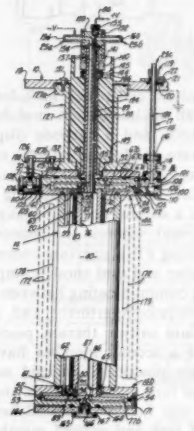
Filed July 13, 1976, Ser. No. 704,831
Int. Cl.² G01N 27/26
U.S. Cl. 204—180 G 18 Claims

1. In an electrophoretic process of determining alkaline phosphatase isoenzymes in a sample comprising a step of applying said sample to a support medium, a step of subjecting the support medium to a differential electric potential to separate said isoenzymes, and a step of rendering said isoenzymes detectable, the improvement wherein said support medium is chosen from the group consisting of agarose gels and cellulose acetate membranes, said support medium containing a buffer and a non-ionic detergent diffused through it.

4,030,996
ELECTRODE TYPE GLOW DISCHARGE METHOD AND APPARATUS

Alan S. Penfold, Playa del Rey, and John A. Thornton, Los Angeles, both of Calif., assignors to Telic Corporation, Santa Monica, Calif.

Division of Ser. No. 178,240, Sept. 7, 1971, Pat. No. 3,884,793. This application Mar. 3, 1975, Ser. No. 554,486
The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.
Int. Cl.² C23C 15/00
U.S. Cl. 204—192 R 5 Claims



1. A method of intentionally sputtering material from a target cathode onto a workpiece, comprising the steps of:

forming a magnetic field of approximately 300 gauss and below within a confined trap region for high and low energy electrons along said cathode, said magnetic field having field lines closely contiguous to and substantially parallel with a central portion of said cathode, said trap region including a cathode sheath within the trap region, substantially all of said high energy electrons being generated on the surface of said cathode by secondary emission;

applying a voltage to said cathode;

disposing said cathode within a gaseous environment of a pressure of approximately 10^{-3} torr or below; and

supporting within said gaseous environment a workpiece intended to be sputter coated, thereby to coat said workpiece with material sputtered from said target cathode.

4,030,997
METHOD OF ALIGNING LIQUID CRYSTALS

Leroy J. Miller, Canoga Park, and Jan Grinberg, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 21, 1975, Ser. No. 570,304
Int. Cl.² G02F 1/16; C23C 15/00
U.S. Cl. 204—192 E 8 Claims

1. A method of achieving an alignment of liquid crystals or liquid crystalline mixtures such that their directors assume a tilt from the perpendicular of a substrate comprising the steps of:

a. overcoating the surfaces of said substrates with a thin layer of materials taken from the group consisting of SiO and SiO_2,

b. ion beam etching said overcoated surfaces at an angle less than 40°,

c. treating said etched surfaces with a mixture of a long chain aliphatic alcohol having the formula $CH_3(CH_2)_nCH_2OH$ where n ranges from 2 to about 18 and an aliphatic amine,

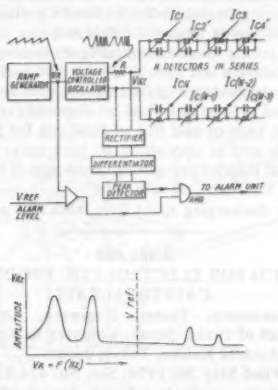
d. washing said treated surfaces with an inert organic solvent, and

e. using said surfaces to construct a device whereby said liquid crystals will be placed in contact with said surfaces.

4,030,998
ANODE ADJUSTMENT

Michel Raymond Barrault, Hoylake, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 4, 1975, Ser. No. 601,497
Claims priority, application United Kingdom, Aug. 16, 1974, 36166/74
Int. Cl.² C25D 21/12; C25C 7/06
U.S. Cl. 204—219 6 Claims

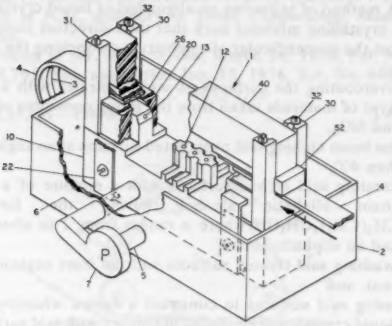


1. In combination with an electrolytic cell having a substantially horizontal flowing mercury cathode and metal anodes suspended on current lead-in rods which pass in vertically adjustable manner through the cell cover, an apparatus for detecting electrical shorting of the anode and the mercury cathode by detecting the variation from a predetermined value of the current flowing in any one of the current lead-in rods which comprises a plurality of saturable resonant circuit devices arranged in a network, each device comprising a fixed capacitor and a saturable inductor including a coil wound on a ferromagnetic core which is arranged near a current lead-in rod so that the permeability of the ferromagnetic core is controlled by the current being carried by the lead-in rod whereby the resonant frequency of the device is a function of said current and changes rapidly with increasing field, and wherein the network is connected to a means for measuring changes in resonance frequency of one or more of said devices.

4,030,999
STRIPE ON STRIP PLATING APPARATUS

Robert M. Allen, Mill Valley, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 6, 1975, Ser. No. 619,952
Int. Cl.² C25D 5/02, 5/08
U.S. Cl. 204—206 2 Claims



1. An apparatus for continuously placing a stripe of a first metallic material on a strip of a second material as said strip is transported through said apparatus comprising:

a pair of spaced rails having a predetermined spacing less than the width of said strip for supporting said strip along its lateral edges;

means for maintaining a fluid-tight seal between said edges of said strip and said rails;

means disposed between said rails for continuously jettting a fluid containing said first metallic material against said strip as said strip is transported through said apparatus;

means forming an electrode wire screen positioned between said fluid jetting means and said strip;

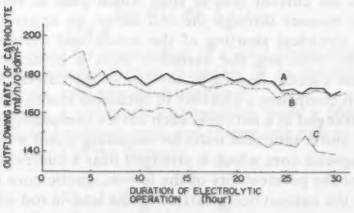
said fluid jetting means comprising a plurality of fluid jets spaced along a line in said spacing between said rails for jetting said fluid through said wire screen and against said strip, and at least one fluid jet disposed, respectively, at opposite ends of said line of fluid jets for jetting a fluid inwardly and in opposition to back-spray of said fluid from said strip for preventing the escape of fluid from said spacing between said rails; and

means for discharging spent fluid from said apparatus.

4,031,000
DIAPHRAGM FOR ELECTROLYTIC PRODUCTION OF CAUSTIC ALKALI

Tadashi Nakamura; Hisami Hagiwara, and Yoshikazu Kokubu, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1974, Ser. No. 474,820
Claims priority, application Japan, June 7, 1973, 48-64204
Int. Cl.² C25B 1/14, 13/02
U.S. Cl. 204—252 4 Claims

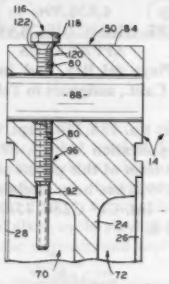


1. In an electrolytic cell for producing an alkali hydroxide comprising a diaphragm dividing said cell into an anolyte chamber and a catholyte chamber, the improvement which comprises said diaphragm comprising a dual microporous layer having an anode side and a cathode side, the anode side microporous layer thereof being made of an acid-resistant material 0.01 to 0.3 millimeter thick bored with micropores having a mean diameter of from 0.05 to 1.5 microns, and the cathode side microporous layer thereof being made of an alkali-resistant material 1 to 6 millimeters thick bored with micropores having a mean diameter of from 3 to 100 microns.

4,031,001
ELECTROLYTIC CELL FOR THE PRODUCTION OF ALKALI METAL HYDROXIDES HAVING REMOVABLE ORIFICES FOR METERING FLUIDS TO THE ANODE AND CATHODE COMPARTMENTS

Primo Bosa, Vancouver, Canada, assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Aug. 29, 1975, Ser. No. 608,956
Int. Cl.² C25B 1/26, 9/00, 15/08
U.S. Cl. 204—257 12 Claims



1. In an electrolytic cell which includes at least a pair of juxtapositioned cell modules, each module including a housing having an anode and a cathode disposed thereon and establishing separate anode and cathode compartments separated by a fluid impermeable web member, said housing further including a first header for supplying fluid to said anode compartment and a second header for supplying fluid to said cathode compartment, wherein the improvement comprises:

said housing having a first aperture communicating between said first header and said anode compartment and a second aperture communicating between said second header and said cathode compartment; and, a first member having a first fluid orifice therein positioned in said first aperture and a second member having a second fluid orifice therein positioned in said second aperture for metering fluid flow into said anode and cathode compartments from said first and second headers, respectively, wherein said first and second members each include a body portion releasably threadedly retained in said first and second aperture and a neck portion penetrating said anode and cathode compartments, respectively.

4,031,002
PASSIVATING METALS ON CRACKING CATALYSTS WITH ANTIMONY COMPOUNDS

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 550,584, Feb. 18, 1975, abandoned. This application June 11, 1976, Ser. No. 695,218
Int. Cl.² C10G 11/04, 9/16
U.S. Cl. 208—113 11 Claims

1. A process for catalytic cracking of hydrocarbons wherein

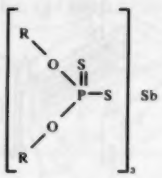
a. a hydrocarbon feed is introduced into a cracking zone,

b. said feed is contacted in said cracking zone with the

cracking catalyst under cracking conditions whereby the feed is cracked,

c. the cracked feed is removed from said cracking zone for further processing, and

d. metals deposited on said cracking catalyst and tending to deactivate said cracking catalyst are passivated by contacting said cracking catalyst with an antimony compound having the general formula



wherein the radicals R which can be the same or different are hydrocarbyl radicals having from 1 to about 18 carbon atoms per molecule.

4,031,003

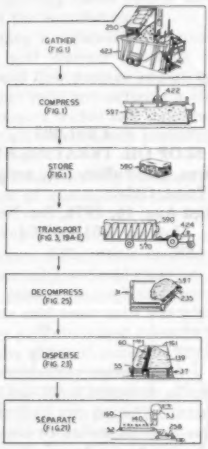
FIELD TO GIN COTTON HANDLING AND STORGE SYSTEMS

Glover A. Husky, 3003 Manioca Road, Lubbock, Tex. 79403

Continuation-in-part of Ser. No. 428,384, Dec. 26, 1973, Pat. No. 3,879,049, which is a continuation-in-part of Ser. No. 513,145, Oct. 8, 1974, abandoned. This application Apr. 14, 1975, Ser. No. 568,004

Int. Cl.[2] B03B *9/00*

U.S. Cl. 209—3 **10 Claims**



1. A preginning apparatus for treating field harvested cotton modules comprising a feeder assembly, a dispersing assembly, and a separator assembly,

said feeder assembly comprising a base and rigid vertical longitudinally extending side wall and, spaced away therefrom and parallel thereto in closed position, a pivotal side door assembly and, below said closed pivotal side door and said rigid side door, a movable conveyor, said side wall firmly fixed to said base

said pivotal side door comprising a frame pivotally attached to said base and extending along a pivotal axis parallel to the length of said rigid side door, and an extensible loading frame movably attached to the top of said pivotal frame,

said extensible frame being movably mounted on said pivotal frame for movement in a direction perpendicular to said pivotal axis and a plurality of parallel roller means located on said extensible frame, each of said roller means having an axis of rotation parallel to said direction of extension;

said movable conveyor comprising an elongated belt attached to means to move said belt along direction of its length;

said dispersing assembly comprising a plurality of spaced apart parallel beating elements extending in a plane at an upwardly oblique angle to the direction of movement of said belt, each of said parallel elements being operatively connected to a means for moving said elements in non-intersecting paths through a common volume of the space between said beating elements;

said separator assembly comprising a pneumatic separator, a discharge duct for cotton and a discharge duct for waste; and a feed belt leading to aid separator; and

said dispersing means located adjacent to said belt of said separator assembly, and

power means operatively attached to means for moving said pivotal side door about its pivotal axis, and power means operatively attached to said extensible frame means for movement thereof towards and away from said pivotal axis, and power means operatively attached to said means to move said conveyor belt, and power means attached to said beating elements of said dispersing assembly and power means operatively attached to said separator assembly to supply an air stream to said pneumatic separator.

4,031,004

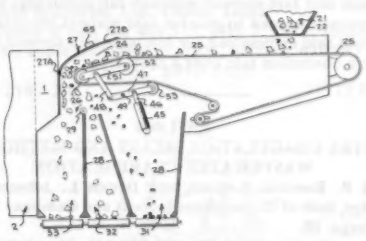
FEED SYSTEM FOR AN ELECTROMAGNETIC EDDY CURRENT MATERIALS SEPARATOR

Edward J. Sommer, Jr., 1908 Beechwood Ave., Nashville, Tenn. 37212; Garry R. Kenny, Rte. 1, College Grove, Tenn. 37046; Frank S. Knoll, 4257 Melrose Ave., Jacksonville, Fla. 32210, and David W. Mitchell, 3946 St. Johns Ave., Apt. 92, Jacksonville, Fla. 32205

Filed May 24, 1976, Ser. No. 689,662

Int. Cl.[2] B03C *1/30*

U.S. Cl. 209—212 **4 Claims**



1. A feed system for delivering feedstock to the region of influence of the magnetic field of an eddy current magnet in an electromagnetic eddy current materials separator, comprising

a. a conveyor assembly having

i. a first end and a second end,

ii. first and second guide means located at said first and second ends,

iii. a conveyor belt,

iv. both guide means being operatively connected to the inner surface of said conveyor belt for maintaining said belt under tension,

v. the first end of the conveyor assembly being disposed adjacent to and upstream of the region of influence of the magnetic field of said magnet,

b. means for supplying feedstock to the conveyor apparatus near the second end thereof,

c. means for detecting the presence of a blockage preventing feedstock from being delivered by the conveyor to the region of influence of the magnetic field of the eddy current magnet and producing a blockage signal in response to the existence of such blockage,

d. means responsive to said blockage signal for lowering or retracting the first guide means.

4,031,005

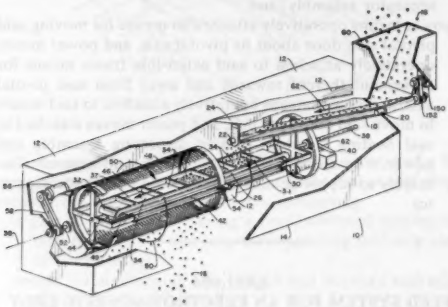
CONTROLLABLE SORBENT BROADCASTER

James J. Der, Monterey Park, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1976, Ser. No. 716,916

Int. Cl.² B07B *1/02*

U.S. Cl. 209—236 **5 Claims**



1. A contollable sorbent broadcaster comprising:

a. an endless belt assembly moving in a substantially horizontal plane formed between a pair of rollers;

b. means disposed adjacent one end of said endless belt assembly for depositing sorbent materials onto said endless belt;

c. means connected to said endless belt assembly for rotating said endless belt assembly about its longitudinal axis such that said sorbent materials fall uniformly; and

d. means disposed to receive said sorbent material falling from said endless belt for releasing said sorbent material at a controlled rate over a drop area.

4,031,006

VORTEX COAGULATION MEANS AND METHOD FOR WASTEWATER CLARIFICATION

Ernest R. Ramirez, Lemont, and Dennis L. Johnson, Woodridge, both of Ill., assignors to Swift and Company Limited, Chicago, Ill.

Continuation-in-part of Ser. No. 666,341, March 12, 1976, abandoned. This application May 17, 1976, Ser. No. 687,236

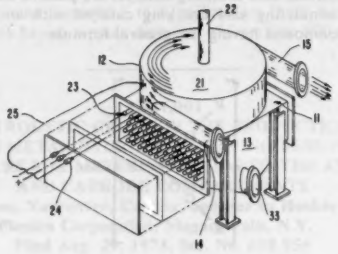
The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.² B01D *12/00*

U.S. Cl. 210—44 **23 Claims**

1. An improved vortex coagulation method for wastewater clarification, comprising the steps of: tangentially introducing a flow of wastewater having impurities into the bottom of a vortex column having a vertical axis; flowing said wastewater flow in an upward spiral through said vortex column; urging the impurities toward the periphery of the vortex column; coagulating impurities near the periphery; supplying a dense zone of bubbles below said vortex column; passing said bubbles upwardly through said vortex column, said bubble passage being concentrated in a central core lying along said axis; establishing a tangential outflow path for the water, bubbles and impurities; and contacting said bubbles with said impurities to form buoyant agglomerates of bubbles and impurities, said contacting being in a venturi-like manner within said outflow path.

13. An improved vortex coagulation apparatus for wastewater clarification comprising: a bubble supply compartment; a means for introducing a supplemental water supply into the



compartment; a cylindrical chamber having a substantially vertical axis, said chamber being mounted above and in communication with said compartment; an inlet in tangential communication with the peripheral bottom of said chamber; and an outlet in tangential communication with the peripheral top of said chamber.

4,031,007

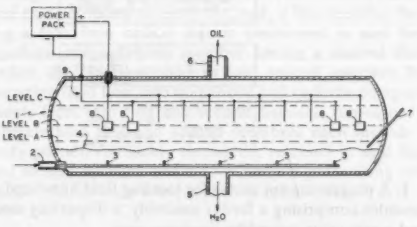
SLOP OIL TREATING SYSTEM

Austin V. Sierra, Jr., Sulfur, La., assignor to Cities Service Company, Tulsa, Okla.

Filed Aug. 16, 1976, Ser. No. 714,468

Int. Cl.² B01D *17/04, 17/06*

U.S. Cl. 210—59 **3 Claims**



1. A method of treating slop oil in an electric coalescer apparatus, in which the oil-water emulsion feed is treated with chemicals, the mixture is fed to the coalescer, and the emulsion mixture is broken by direct electric current to give oil and water layers, wherein the improvement comprises:

a. employing a probe that produces a signal when the interface between the oil and water layers approaches a predetermined level in the coalescer, and

b. employing vertically-placed extensions on the bottoms of at least two of the coalescer plates, said extensions acting as a warning device, said improvement offering a continuous method of treatment.

4,031,008
ARTIFICIAL KIDNEY DEVICE

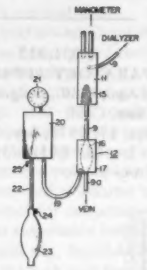
Gousuke Anno, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 529,500, Dec. 4, 1974, Pat. No. 3,986,956. This application Dec. 22, 1975, Ser. No. 643,301

Claims priority, application Japan, Dec. 23, 1974, 49-147859

Int. Cl.² B01D 31/00

U.S. Cl. 210—137 34 Claims



1. An artificial kidney device for a human being comprising:

a dialyzer for removing specified components from blood;

blood pumping means for transporting blood from an artery of the human being to the dialyzer and creating a blood pressure in the dialyzer above arterial pressure;

means forming a flow passage in communication with said dialyzer for transporting blood passed through the dialyzer to a vein of the human being;

means for maintaining a substantially constant ultrafiltration pressure in said dialyzer including an inner tube forming part of said flow passage and an outer tube surrounding said inner tube and defining a closed chamber therewith, the pressure within said inner tube being subject to change in accordance with prevailing blood pressure in said dialyzer;

means for providing a substantially constant predetermined pressure in excess of atmospheric pressure within said closed chamber;

said inner tube being formed of material deformable in response to pressure differentials created between the inside of said inner tube and said chamber to enlarge or restrict said flow passage through said inner tube so that the pressure inside said inner tube will balance the substantially constant predetermined pressure in said closed chamber to thereby maintain said ultrafiltration pressure in the dialyzer substantially constant;

means including a gas filled reservoir coupled with said chamber for absorbing any pressure fluctuation in said chamber in response to deformation of said inner tube, and

means for preventing ingress of gas from said reservoir into said chamber thereby minimizing the quantity of gas flowing into said flow passage in the event of a rupture of said inner tube.

4,031,009
COMBINED LEACHING AND SUMP CATCH-BASIN

Robert M. Hicks, 124 Main St., Westford, Mass. 01886

Continuation of Ser. No. 455,790, March 28, 1974, abandoned. This application Oct. 9, 1975, Ser. No. 620,866

Int. Cl.² B01D 21/10

U.S. Cl. 210—164 3 Claims

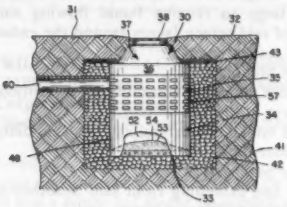
1. In a surface drainage system the combination of:

a generally cylindrical wall of stone formed in the earth and extending vertically below ground surface level to define a hole of predetermined depth and breadth greater than conventional catch basin dimensions;

a pre-cast, reinforced concrete, catch basin of predetermined, oversize height and breadth substantially filling said hole, and of hollow cylindrical configuration, said catch basin having:

a solid circular bottom wall;

a solid, hollow, cylindrical, lower side wall, of uniform annular cross section upstanding from said bottom wall to substantially half the height of said catch basin, and sealed by a sealing joint to said bottom wall, to form a sealed, unapertured, undrained sump receptacle for collecting drain water, silt, leaves and the like up to substantially half the volume of said catch basin without leakage into the surrounding environment;



a solid, hollow, cylindrical, upper side wall, upstanding from said lower side wall and having a pattern of leaching apertures spaced from top to bottom thereof, each aperture extending from the inside to the outside of said upper side wall for leaching cleared water, rising from said sump receptacle up to the level of said apertures, out into said wall of stone and surrounding earth,

a sealing joint connecting said upper side wall to said lower side wall

and cone and grille means forming an opening at the top of said catch basin for receiving surface drainage.

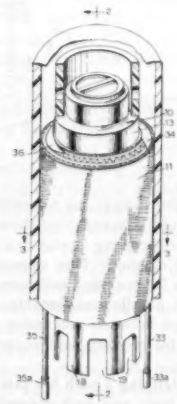
4,031,010
COMBINED DIALYZER AND ADSORBER UNIT

Yukihiko Nose, Cleveland Heights, Ohio, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 466,513, May 2, 1974, abandoned. This application Sept. 5, 1975, Ser. No. 610,882

Int. Cl.² B01D 31/00

U.S. Cl. 210—202 11 Claims



1. An artificial kidney apparatus comprising, in combination, a combined dialyzer and adsorber unit having a cylindrical container having a top cover with an aperture therein and an apertured bottom cover and a mass of adsorbent therein, a

flat tube of membrane material permeable to uremic wastes and toxic materials in blood wrapped in a coil around said cylindrical container, a screen layer between each of the coils of the tube, a blood inlet tube connected to one end of the flat tube and a blood outlet tube connected to the other end of the flat tube, said blood tubes extending to the exterior of the sleeve, and a unit cover over said coil around said cylindrical container and over the end of the container having the top cover thereon and being spaced from the top cover sufficiently to give access to the aperture in the cover, the bottom of said cover being completely open for exposing the entire area of the edges of said screen layers toward the bottom of said unit, said container and covers being of a moldable plastic inert to the dialysate, said aperture in said top cover being sufficiently large to receive liquid flowing simultaneously through all of said screen layers around the entire circumference of said screen layers;

a dialysate holding tank;

a unit holder tank in which said unit is positioned with said unit cover at the top thereof;

a dialysate intake line extending from said dialysate tank to unit holder tank;

a dialysate pump;

a suction line extending from said adsorber outlet to the intake of said dialysate pump; and

a return line from the outlet of said dialysate pump to said diaylsate holding tank,

whereby when dialysate fills said unit holder tank with the uncovered edges of said screen layers immersed in dialysate and dialysate is caused to flow through the unit, dialysate flows evenly over the turns of the coil along the screen layers around the entire periphery of the unit and all of the coil is utilized for exchange of impurities from the blood within the coil to the dialysate flowing over the outside of the coil.

4,031,011

MAGNETIC FILTER APPARATUS

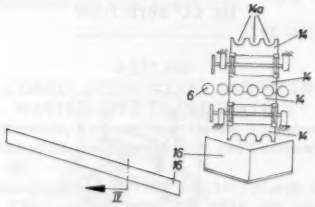
Friedrich Dorgathen, Hosel, Germany, assignor to Montanus Industrieanlagen GmbH, Essen, Germany

Filed June 19, 1975, Ser. No. 588,404

Claims priority, application Germany, June 21, 1974, 2429849

Int. Cl.² B01D *35/06*

U.S. Cl. 210—222 **8 Claims**



1. A magnetic filter apparatus for removing magnetisable material from a liquid contaminated therewith, comprising:

a. a container for receiving contaminated liquid;

b. a plurality of magnetic bars operatively engaged with support means for securing said bars in spaced, substantially mutually parallel relationship, thereby defining a plurality of gaps between successive bars;

c. drive means for moving said support means and said magnetic bars;

d. guide means defining a path for said support means and said magnetic bars, said path extending at least partially within the liquid in said container and partially above the liquid in said container;

e. cleaning means, disposed substantially vertically above the surface of the liquid in said container and at a position contiguous with said path for said support means, for operative engagement with said magnetic bars for removing magnetisable material therefrom; and,

f. discharge means disposed vertically intermediate said cleaning means and the surface of the liquid in said container for receiving magnetisable material removed from said bars by said cleaning means;

wherein said cleaning means comprises a plurality of wiper blades, with recesses of complementary geometrical configuration with respect to the geometrical shape of the magnetic bars, arranged to extend substantially around the periphery of at least one of said magnetic bars, and means for moving said wiper blades across the surfaces of said magnetic bars.

4,031,012

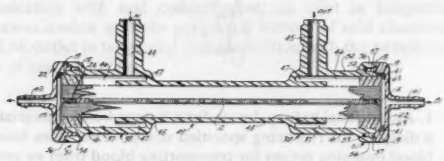
SEPARATORY APPARATUS

Paul W. Gics, Santa Ana, Calif., assignor to Gics Pharmaceuticals, Inc., Santa Ana, Calif.

Filed Sept. 17, 1975, Ser. No. 614,268

Int. Cl.² B01D *13/00*

U.S. Cl. 210—321 A **31 Claims**



1. A separatory apparatus comprising a supporting core, at least one layer of selectively permeable continuously hollow fibers positioned on the supporting core, core extenders attached to the core where the fibers terminate, and potting compound attaching at least the terminal portions of the fibers to the core extenders, the core extenders being fabricated from a material with about the same rigidity and about the same density as the potting compound.

4,031,013

METHOD AND APPARATUS FOR FIBER SUSPENSION DEWATERING

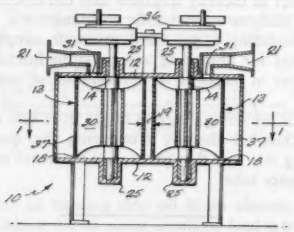
Arne Skretting, Karlstad, Sweden, assignor to Kamyr Aktiebolag, Karlstad, Sweden

Filed Mar. 26, 1975, Ser. No. 562,185

Claims priority, application Sweden, Apr. 2, 1974, 7404409

Int. Cl.² B01D *33/06, 33/10*

U.S. Cl. 210—326 **2 Claims**



1. Apparatus for dewatering a fiber suspension comprising

a. a sealed housing having an inlet at a first pressure for introduction of a fiber suspension having a relatively low solids concentration, and a first outlet at a second pressure less than said first pressure for removal of a fiber suspension having a relatively high solids concentration,

b. first and second drums mounted for rotation about vertical axes in the vicinity of said first outlet, each of said drums having a perforated exterior surface in substantial

360° engagement with suspension in said housing and an inner liquid chamber, and said exterior surfaces of said drums cooperating for pressing liquid from suspension passing therebetween into the interior chamber of the drums, said drums having a nip point therebetween,

c. means for adjustably mounting shafts defining said drums' vertical axes so that the nip between the drums can be adjusted and thereby the concentration of suspension exiting said first outlet,

d. a pair of second outlets from said housing at a third pressure intermediate said first and second pressures, a said second outlet being located above each of said drum chambers and spaced from the shaft mounting each drum for rotation about a vertical axis,

e. means for rotating said drums about their vertical axes in a direction so that solids engaged thereby are adapted to flow toward said first outlet, and

f. means for substantially preventing the passage of fiber suspension through said first outlet without passing through said nip point, said means including a first member having an extending edge thereof adjacent the periphery of said first drum at a point spaced toward said outlet from said nip point, and a second member having an extending edge thereof for cooperation with said second drum, whereby fiber suspension introduced into said inlet will pass through said nip, liquid being extracted therefrom, and will pass through said first outlet after addition thereto of an amount of liquid from the interior chambers of said drums.

4,031,014
METHOD OF REDUCING FRICTION LOSS

Thomas J. Griffin, Jr., Sand Springs, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 656,675, Feb. 9, 1976. This application June 22, 1976, Ser. No. 698,666
Int. Cl.² C09K *3/00*
U.S. Cl. 252—8.55 R **27 Claims**

1. A method of reducing the friction loss generated by an organic liquid flowing through a confining conduit which comprises:

mixing up to about 0.9 gallon per 1000 gallons of said organic liquid of an organic phosphate ester reaction product comprising the reaction of

a pentavalent phosphorous compound with a hydroxy ether of the formula ROR_1OH wherein R is a C_1 to C_6 allyl group, R_1 is a C_2 or C_3 alkylene group and the total carbon atoms of R and R_1 range from 3 to about 8; and

when the total carbon atoms of R and R_1 is 3 or 4, with a long chain monohydric aliphatic alcohol containing at least 5 carbon atoms; when the total carbon atoms of R and R_1 are five or more with an alcohol selected from the group consisting of a long chain monohydric aliphatic alcohol containing at least 5 carbon atoms, a short chain monohydric aliphatic alcohol containing from one to four carbon atoms or a mixture of said alcohols, said reaction being conducted at a temperature ranging from about 70 to about 90° C for a period of time of from about 1.5 to about 6 hours and a sufficient quantity of a basic salt containing a multivalent metal cation to provide friction reduction.

16. A method of reducing the friction loss generated by an organic liquid flowing through a confining conduit which comprises mixing 0.9 gallon per 1000 gallons of said organic liquid of an organic phosphate ester reaction product comprising the reaction of,

P_2O_5 with a hydroxy ether compound of the formula ROR_1OH wherein R is a C_1 to C_6 alkyl group and R_1 is a C_2 or C_3 alkylene group and the total carbon atoms of R and R_1 ranges from 3 to about 8; and

when the total carbon atoms of R and R_1 is 3 or 4 with a long chain aliphatic monohydric alcohol containing from 5 to about 12 carbon atoms, when the total carbon atoms of R and R_1 is 5 to 8, with an alcohol selected from the group consisting of a long chain monohydric aliphatic alcohol containing from 5 to about 12 carbon atoms, a short chain monohydric aliphatic alcohol containing from 1 to 4 carbon atoms or a mixture of said alcohols, the individual mole ratios of the hydroxy ether, the long chain alcohol and the short chain alcohol to P_2O_5 are within the ranges of 0.4:1 to 4.5:1; 0:1 to 4.0:1 and 0.5:1 to 5.0:1 respectively, said reaction being conducted at a temperature ranging from about 70° to about 90° C for a period of time of from about 1.5 to about 6 hours, and a sufficient basic salt containing a multivalent metal cation to provide friction reduction.

27. The method of claim **16** wherein the confining conduit is a wellbore.

4,031,015
NITRILE-AMINE REACTION PRODUCTS

Clark Ober Miller, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Filed Mar. 26, 1973, Ser. No. 345,022
Int. Cl.² C10M *1/32*
U.S. Cl. 252—50 **12 Claims**

1. A lubricant composition comprising a major amount of a lubric ting oil and a minor but sludge dispersing amount of at least one organonitrogen composition made by

A. reacting (i) one equivalent of one olefin or halogenated olefin containing at least about 30 carbon atoms with 0.5 to 1.5 equivalents of (ii) at least one α,β-unsaturated nitrile of the formula

wherein R_1 and R_2 are hydrogen or substantially hydrocarbyl radicals of 1 to about 28 carbons, R_3 is a C_2 to C_{28} substantially hydrocarbyl group containing at least one unsaturated linkage alpha, beta to at least one nitrile group and x is 2 to about 10 at a temperature of about 100° C up to the decomposition temperature of a component of the reaction mixture to form an organonitrile intermediate and

B. further reacting at a temperature of 30° C up to the decomposition point of the reactants or the products an equivalent of said intermediate with about 0.5 to 5 equivalents of a nitrogen compound chosen from the group contisting of (i) at least one amine of the formula

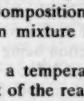
wherein each R is independently hydrogen, a substantial hydrocarbyl group or a hydroxyl-substituted substantial hydrocarbyl group having up to about 30 carbon atoms; (ii) at least one alkylene polyamine containing up to about 10 nitrogen atoms; (iii) at least one heterocyclic amine containing at least one -NH- group incorporated in the cycle, 3 to 10 atoms in the cycle and a total of about 2 to 30 carbon atoms; and (iv) mixtures of at least two of (i), (ii) or (iii).

7. A fuel composition comprising a major amount of a normally liquid fuel and a minor but corrosion inhibiting amount of at least one organonitrogen composition made by the process comprising

A. reacting (i) one equivalent of at least one olefin or halogenated olefin containing at least about 30 carbon atoms with 0.5 to 1.5 equivalents of (ii) at least one α,β-unsaturated nitril of the formula

wherein R_1 to R_2 are hydrogen or substantially hydrocarbyl radicals of 1 to about 28 carbons, R_3 is a C_2 to C_{28} substantially hydrocarbyl group containing at least one unsaturated linkage alpha, beta to at least one nitrile group and x is 2 to about 10, at a temperature of about 100° C up to the decomposition temperature of a component of the reaction mixture of form an organonitrile intermediate and

B. further reacting at a temperature of 30° C up to the decomposition point of the reactants or the products an equivalent of said intermediate with 0.5 to 5 equivalents of a nitrogen compound chosen from the group consisting of (i) at least one amine of the formula



wherein each R is independently hydrogen, a substantially hydrocabyl group or a hydroxyl-substituted substantially hydrocarbyl group having up to about 30 carbon atoms; (ii) at least one alkylene polyamine containing up to about 10 nitrogen atoms; (iii) at least one heterocyclic amine containing at least one —NH— group incorporated in the cycle, 3 to 10 atoms in the ring and a total of about 2 to 30 carbon atoms; and (iv) mixtures of at least two of (i), (ii), or (iii).

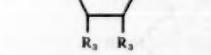
4,031,016
BASE OIL COMPOSITIONS HAVING IMPROVED LIGHT STABILITY

Hans Berger; Gerhard De Lind Van Wijngaarden, and Jacobus H. Breuker, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 15, 1975, Ser. No. 641,052
Int. Cl.² C10M *1/34*
U.S. Cl. 252—50 **18 Claims**

1. A base oil composition comprising a major portion of a hydroprocessed base oil and a daylight stability enhancing amount of

1. a compound of the general formula:



(I)

wherein R_1 is a substituted or unsubstituted aliphatic, aromatic or a four to eight member heterocyclic group comprised of from one to five hetero-atoms selected from the class of nitrogen, oxygen, phosphorus and sulfur; R_2 is hydrogen or the same group as R_1, and each R_3, which may be the same or different, is selected from the class consisting of hydrogen and an alkyl group of from one to six carbon atoms; and

2. a singlet oxygen quencher.

4,031,017
PHOSPHOSULFURIZED HYDROCARBON MODIFIED N-(HYDROXY AND ALKYL-SUBSTITUTED BENZYL) ALKYLENE POLYAMINE

Albert R. Sabol, Munster, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 7, 1976, Ser. No. 674,614
Int. Cl.² C09B *49/00*
U.S. Cl. 252—46.7 **6 Claims**

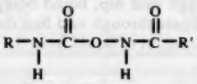
1. A product obtained by the condensation of a (1) C_{50} to C_{160} alkyl-substituted phenol, (2) an alkylene polyamine, (3) a source of formaldehyde, and (4) a phosphosulfurized hydrocarbon derived from P_2S_5 and a 500 up to 2240 $\overline{M}_n$ olefin polymer used in the respective molar reactant proportions of the four reactants of 1.0:0.1–10.0:1.0–10.0:0.5–3.0.

4,031,018
AUXILIARY ANTIOXIDANTS

Zatis L. Murphy, Cypress, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 28, 1976, Ser. No. 653,068
Int. Cl.² C10M *1/38*
U.S. Cl. 252—47.5 **4 Claims**

1. A lubricant composition comprising a major amount of an ester lubricant base stock selected from the group consisting of esters of carboxylic acids and an oxidation inhibiting amount of a mixture consisting essentially of 1) an antioxidant selected from the group consisting of arylamines and phenothiazine and 2) a N-acyl-O-carbamylhydroxyl-amine auxiliary antioxidant corresponding to the formula



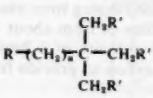
wherein R and R′ each represent a hydrocarbyl radical selected from the class consisting of straight-chain, branched-chain and cyclic aliphatic radicals of 2 to 12 carbon atoms, said hydrocarbyl radicals being saturated or unsaturated; or an aromatic hydrocarbyl radical selected from the class consisting of aryl, alkaryl and aralkyl radicals of 6 to 14 carbon atoms.

4,031,019
ALCOHOL ESTERS OF FATTY ACIDS AS USEFUL METALWORKING LUBRICANTS

Edward W. Bell, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 267,314, June 29, 1972, abandoned. This application Oct. 3, 1975, Ser. No. 619,411
Int. Cl.² C10M *1/24*
U.S. Cl. 252—56 S **8 Claims**

1. A continuous steel casting mold lubricant composition consisting essentially of a mixture of compounds having the formula:



where $n = 1$; R = H—, CH_3—, or R′; or where $n = 2$, R = H—, or CH_3—; and R′ = isolinoleoyloxy, isooleoyloxy, stearoyloxy, or palmitoyloxy radicals, said mixture of compounds containing from a trace to about 45 mole percent of isolinoleoyloxy radicals, from about 44 to about 76 mole percent of isooleoyloxy radicals, from about 3 to about 18 mole percent of stearoyloxy radicals, and from about 5 to about 13 mole percent of palmitoyloxy radicals, said mixture also containing from a trace to about 59 mole percent of isolated trans double bonds, from 0 to about 16 mole percent of conjugatable double bonds, and from a trace to about 40 mole percent of nonconjugatable double bonds.

4,031,020

CENTRAL SYSTEM FLUID COMPOSITION

Kensuke Sugiura, Kawasaki; Mineo Kagaya, Yokohama; Tokuo Fujisou, Kawasaki; Hiroyuki Aoki, Urawa; Takeichiro Takehara, and Shigenori Kurata, both of Yokohama, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo and Nissan Motor Co., Ltd., both of, Japan

Filed May 29, 1975, Ser. No. 582,404

Claims priority, application Japan, May 31, 1974, 49-60898

Int. Cl.² C10M 1/24

U.S. Cl. 252—56 R 15 Claims

1. A central system fluid composition consiting essentially of 5–30% by weight of a viscosity index improver and the balance being essentially a hydrocarbon base oil, which is characterized in that the hydrocarbon base oil is composed of 50–100% by weight, based on its total weight, of at least one chief base oil component selected from the group consisting of

A. polybutenes with an average molecular weight of 100–500,

B. homo- or copolymers of at least one α-olefin containing 2–12 carbons, excepting butenes, said homo- or copolymer having a molecular weight of 100 to 500 and wherein the copolymers are obtained by copolymerizing a mixture of said α-olefins with each other; and

C. hydrogenation products boiling at 250°–380° C of high aromatic hydrocarbons which are obtained by cracking petroleum oils,

and 0–50% by weight, based on its total weight, of a mineral oil,

and wherein the viscosity index improver is composed of at least one component selected from the group consisting of

1. polymethacrylates with an average molecular weight of 50,000–200,000, which are obtained by polymerizing at least one ester of a saturated, monohydric aliphatic alcohol of 1–18 carbons with methacrylic acid, and

2. copolymers with an average molecular weight of 40,000–200,000 selected from the group consisting of ethylene-propylene copolymers, butadiene-styrene copolymers and isoprene-styrene copolymers.

10. In an improved central system fluid composition comprising a major proportion of a base oil, a viscosity index improver and an effective amount up to 10% of at least one additive selected from the group consisting of detergents, antioxidants, metal deactivators and antifoaming agents, the improvement wherein the base oil and viscosity index improver comprises the composition of claim 1.

4,031,021

MAGNETIC TONER COMPOSITIONS

Philip H. Deming, 5 Orchard Hill, Newtown, Conn. 06470

Filed Mar. 25, 1974, Ser. No. 454,270

Int. Cl.² G03G 9/08

U.S. Cl. 252—62.1 P 16 Claims

1. A magnetic toner composition for use in decorating a magnetically imaged substrate in magnetic printing machines for transfer to a reading medium comprising a particulate blend of

A. between about 50% and about 99% by weight of magnetic particles having a contrasting color with respect to the color of said reading medium and

B. between about 1% and about 50% by weight of non-magnetic, frictionally electrifiable particles in a concentration sufficient to physically adhere to the magnetic particles and to be also present as a separate phase of particles substantially non-adhering to the magnetic particles and having a color non-contrasting with the color of said reading medium.

4,031,022

BUILDERS FOR DETERGENT AND CLEANING COMPOSITIONS

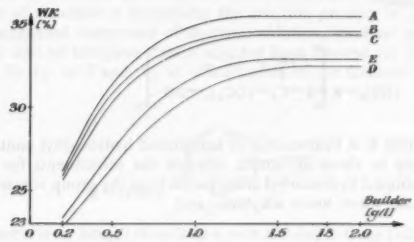
Wilhelm Vogt, Hurth-Efferen; Eberhard Auer, Erftstadt Liblar; Günter Lenz, Frachen-Bachem; Karl Merkenich, Hurth-Efferen; Klaus Henning, Hurth-Hermulheim, and Joachim Kandler, Erftstadt Lechenich, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 472,298, May 22, 1974, abandoned. This application Mar. 2, 1976, Ser. No. 663,053

Claims priority, application Germany, May 28, 1973, 2327141

Int. Cl.² C11D 3/20, 7/26

U.S. Cl. 252—89 R 5 Claims



1. Detergent and cleaning compositions in which the principal cleaning components are an anion-active, cationic, amphoteric, ampholytic or non-ionic surfactant and an organic builder consisting of a copolymer of alpha-hydroxyacrylic acid and acrylic acid, said copolymer having a specific viscosity within the range 0.05 and 1.0 determined on 1 weight % solution of the copolymer in aqueous 2N-sodium hydroxide solution at 20° C, and containing between about 9 and 85 mol % of acrylic acid and the said copolymer being present in the compositions in a proportion within the range 10 and 90 weight %.

4,031,023

LUBRICATING COMPOSITIONS AND METHODS UTILIZING HYDROXY THIOETHERS

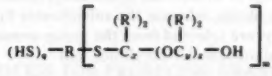
Jerry Lee Musser, Chardon, and Frederick William Koch, Willoughby Hills, both of Ohio, assignors to The Lubrizol Corporation, Cleveland, Ohio

Filed Feb. 19, 1976, Ser. No. 659,454

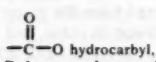
Int. Cl.² C10M 1/38

U.S. Cl. 252—48.2 25 Claims

1. A transmission or railroad diesel lubricating composition comprising a major amount of a lubricating oil and a minor amount, sufficient to improve the oxidative stability of the lubricating composition, of one or more additives of the formula:

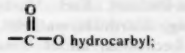


wherein R is a hydrocarbyl or substituted hydrocarbyl containing up to about 30 carbon atoms, wherein the substituents for the substituted hydrocarbyl are selected from the group consisting of halo, nitro, lower alkoxy, lower alkylthio, and



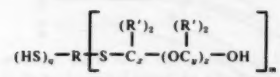
and R has a valence of $m + q$; each R' is independently selected from hydrogen, hydrocarbyl or substituted hydrocarbyl of up to about 20 carbon atoms, wherein the substitu-

ents for the substituted hydrocarbyl are selected from the group consisting of halo, nitro, lower alkoxy, lower alkylthio, and

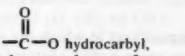


x and y are independently an integer of from 2 to 5; z is an integer of from zero to 5; q is an integer of from zero to 4; and m is an integer of from 1 to 5 with the proviso that the sum of $m + q$ is from 1 to 6.

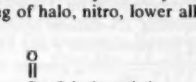
21. A concentrate, suitable for the preparation of transmission or railroad diesel lubricating compositions, which comprises a substantially inert, normally liquid organic diluent and from about 10% to about 90% of at least one additive of the formula:



wherein R is hydrocarbyl or substituted hydrocarbyl containing up to about 30 atoms, wherein the substituents for the substituted hydrocarbyl are selected from the group consisting of halo, nitro, lower alkylthio, and

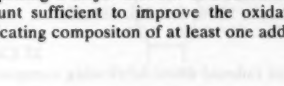


and R has a valence of $m + q$; each R′ is independently selected from hydrogen, hydrocarbyl or substituted hydrocarbyl of up to about 20 carbon atoms, wherein the substituents for the substituted hydrocarbyl are selected from the group consisting of halo, nitro, lower alkoxy, lower alkylthio, and

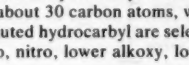


x and y are independently an integer of from 2 to 5; z is an integer of from zero to 5; q is an integer of from zero to 4; and m is an integer of from 1 to 5 with the provisio that the total of $m + q$ is from 1 to 6.

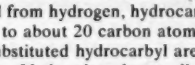
25. A method of lubrication in transmission or railroad diesel environments which comprises contacting a lubricating surface with an effective amount of a lubricating composition comprising a major amount of a lubricating oil and a minor amount sufficient to improve the oxidative stability of the lubricating compositon of at least one additive of the formula:



wherein R is hydrocarbyl or substituted hydrocabyl containing up to about 30 carbon atoms, wherein the substituents for the substituted hydrocarbyl are selected from the group consisting of halo, nitro, lower alkoxy, lower alkylthio, and



and R has a valence of $m + q$; each R′ is independently selected from hydrogen, hydrocarbyl or substituted hydrocarbyl of up to about 20 carbon atoms, wherein the substituents for the substituted hydrocarbyl are selected from the group consisting of halo, nitro, lower alkoxy, lower alkylthio, and



x and y are independently an integer of from 2 to 5; z is an integer of from zero to 5; q is an integer of from zero to 4; and m is an integer of from 1 to 5 with the proviso that the sum of $m + q$ is from 1 to 6.

4,031,024

PROCESS FOR IMPROVING THE STABILITY AND SHAPING OF ANHYDROUS SODIUM METASILICATE, AND THE COMPOSITIONS CONTAINING SAME, AND THE RESULTING PRODUCTS

Georges Vrisakis, Collonges-Au-Mont-d'Or, France, assignor to Societe Francaise des Silicates Speciaux "Sifrance", Coubevoie, France

Filed June 9, 1975, Ser. No. 584,755

Claims priority, application France, June 10, 1974, 74.19931

Int. Cl.² C11D *3/08, 3/22, 11/00, 17/06*

U.S. Cl. 252—135 **10 Claims**

1. A process for improving the stability and facilitating the form of sodium metasilicate containing by weight less than 10% of water, and the compositions containing same, characterized in that said sodium metasilicate is combined with at least one gluconic compound selected from the group consisting of gluconic acid and water soluble sodium salts thereof in the ratio of 100 grams of sodium metasilicate per 2 to 10 cm^3 of a saturated aqueous solution of the gluconic compound, and 1–10% by weight of a non-ionic surface active agent, to obtain a particulate product having improved resistance to caking and formation of dust.

10. A particulate composition containing by weight from 20% to 60% of sodium metasilicate, from 0.2% to 2% of gluconic compound selected from the group consisting of gluconic acid and sodium salt thereof, and from 1% to 5% of a non-ionic surface active agent, the resulting product having improved resistance to caking and formation of dust.

4,031,025

CHITOSAN DERIVATIVE, SEQUESTERING AGENTS FOR HEAVY METALS

Guy Vanlerberghe, Montjay-la-Tour, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

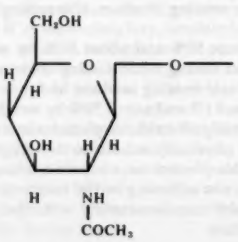
Division of Ser. No. 504,953, Sept. 11, 1974, Pat. No. 3,953,608, which is a division of Ser. No. 251,263, May 8, 1972, Pat. No. 3,879,376. This application Jan. 14, 1976, Ser. No. 648,939

Claims priority, application Luxembourg, May 10, 197[illegible], 63142; Apr. 18, 1972, 65186

Int. Cl.² C02B *5/06*

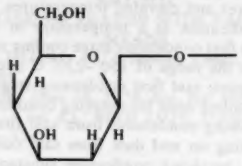
U.S. Cl. 252—180 **4 Claims**

1. A sequestering agent for ions of a heavy metal in an aqueous solution consisting essentially of a chitosan derivative consisting of randomly distributed patterns of the formulae:

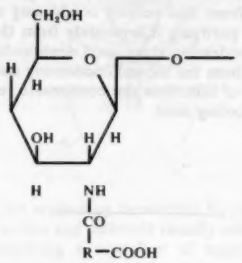


(A)

-continued

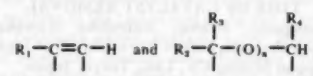


(B)



(C)

the proportions of these three patterns being, respectively, 5 to 30% for A, 5 to 40% for B and 30 to 90% for C, R representing a member selected from the group consisting of



wherein R_1 represents a member selected from the group consisting of hydrogen and methyl, n is equal to (a) 0, in which case R_2, R_3 and R_4, each independently, represent a member selected from the group consisting of hydrogen, methyl, hydroxy, acetoxy, amino, monoalkylamino or dialkylamino wherein the alkyl moiety of each has 1–12 carbon atoms and wherein each is optionally interrupted by one or more nitrogen atoms or substituted by one or more amino, hydroxyl, mercapto, carboxyl, alkylthio wherein the alkyl moiety has 1 to 8 carbon atoms and sulfonic groups, alkylthio wherein the alkyl moiety has 1–4 carbon atoms and carries an amino residue, and a residue of glutathion, at least one of R_2, R_3 and R_4 being hydrogen and radicals R_2 and R_3 being able to form together a methylene radical, and (b) 1, in which case R_2, R_3 and R_4 each represent hydrogen, and the salts formed by this derivative with a base selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonia, lime, magnesia and alkanolamine and an acid selected from the group consisting of hydrochloric, phosphoric, acetic, lactic, tartaric and citric.

4,031,026

DIPHENYLMETHANE DIISOCYANATE COMPOSITIONS

Arthur Ibbotson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 10, 1976, Ser. No. 684,963

Claims priority, application United Kingdom, May 19, 1975, 21293/75

Int. Cl.² C07C *119/48*

U.S. Cl. 252—182 **10 Claims**

1. A diphenylmethane diisocyanate composition which comprises diphenylmethane diisocyanate, a diphenylmethane diisocyanate uretonimine group-containing derivative, a reaction product of diphenylmethane diisocyanate and a diol of molecular weight less than 175 and not more than 10% by weight of methylene bridged polyphenyl polyisocyanates of isocyanate functionality higher than two, the composition having an isocyanate functionality of not more than 2.3.

4,031,027

CHEMICAL SURFACE COATING BATH

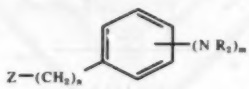
Saul Kessler, Canoga Park, Calif., assignor to Joseph W. Aidlin, Los Angeles, Calif.

Division of Ser. No. 607,127, Aug. 25, 1975, Pat. No. 3,996,115. This application Dec. 8, 1975, Ser. No. 638,842

Int. Cl.² C25D *11/08, 11/30*

U.S. Cl. 252—186 **9 Claims**

1. A composition for the chemical finishing of metal surfaces comprising an aqueous vehicle containing an inorganic oxidant capable of forming a passivated metal salt or metal oxide layer on said metal surface and from 0.1 to 50 grams per liter of an additive comprising the reaction product of (a) a halogenated compound of flourine, chlorine, bromine or iodine and an inorganic cation selected from Groups 1*b*, 2, 3*a*, 4*b*, 5*b*, 6*b*, or 8 and (b) an alkarylamine of the formula:



where n is an integer from 0 to 4, m is an integer from 1–2 and R is selected from hydrogen, lower alkyl or 1–9 carbon atoms, lower alkanol of 1–8 carbon atoms, aryl or aralkyl and Z is CX_2 where X is fluoro, chloro, bromo, or iodo.

4,031,028

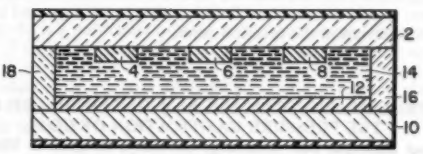
NEMATIC LIQUID CRYSTAL COMPOSITION

Robert Craig Maze, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 18, 1976, Ser. No. 697,506

Int. Cl.² G02F *1/13;* **C09K** *3/34*

U.S. Cl. 252—299 **3 Claims**



1. The liquid crystal composition consisting essentially of the compounds N-(p-methoxybenzylidene)-p-butylaniline, N-(p-ethoxybenzylidene)-p-butylaniline, p[(butyloxybenzylidene)-amino] benzonitrile, p-pentyloxyphenyl-p′-pentylbenzoate, and p-pentylphenyl-p′-cyanobenzoate, said compounds to be present in said composition in substantially eutectic proportions.

4,031,029

PROCESS FOR PRODUCING URANIUM OXIDE RICH COMPOSITIONS FROM URANIUM HEXAFLUORIDE USING FLUID INJECTION INTO THE REACTION ZONE

John Cecil Colter, Wilmington, N.C.; Dean B. James, Saratoga, Calif.; Walter Gill Keith, and Reza Akbari-Kenari, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

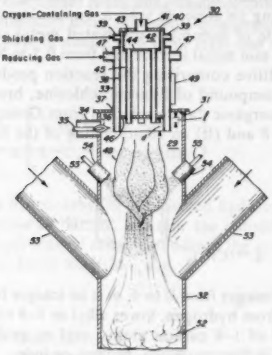
Filed July 2, 1975, Ser. No. 592,508

Int. Cl.² C01G *43/02*

U.S. Cl. 252—301.1 R **20 Claims**

1. In the method of preparing a uranium oxide rich composition from uranium hexafluoride in a reaction zone in the presence of an active flame comprising the steps of introduc-

ing a first gaseous reactant comprising a mixture of uranium hexafluoride and an oxygen-containing carrier gas into the reaction zone, separately introducing a second gaseous reactant comprising a reducing gas into the reaction zone and separately introducing a shielding gas into the reaction zone between the first gaseous reactant and the second gaseous reactant which temporarily prevents substantial mixing and reaction between the first gaseous reactant and the second gaseous reactant until sufficient cross diffusion of the reactants and the shielding gas occurs as the reactants and the shielding gas pass through the reaction zone, resulting in a reaction forming a primary flame and producing a particulate



uranium dioxide rich composition and gaseous reaction products, and introducing a third gaseous reactant comprising an oxygen-containing gas into contact with the particulate uranium dioxide rich composition and gaseous reaction products thereby converting the gaseous reaction products in the reaction zone in a secondary flame to an oxidized form and oxidizing the uranium dioxide rich composition to a higher oxide of uranium, the improvement comprising the step of directly introducing an atomized fluid having a high latent heat of evaporation into the reaction zone at a location in the reaction zone so that the atomized fluid is converted to a gas and cools the materials in the reaction zone.

4,031,030

PROCESS FOR TREATING RAW GAS PRODUCED BY THE PRESSURE GASIFICATION OF COAL

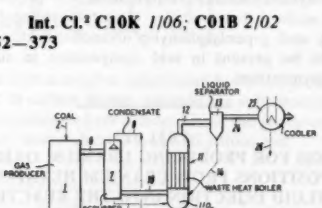
Paul Rudolph, Bad Homburg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 10, 1976, Ser. No. 665,670

Claims priority, application Germany, Sept. 20, 1975, 2542055

Int. Cl.² C10K *1/06*; C01B *2/02*

U.S. Cl. 252—373 **8 Claims**



1. In a process for treating raw gas produced by the gasification of coal with oxygen and water vapor under a pressure of 5–120 atmospheres and elevated temperatures, said raw gas leaving said gasification at a temperature in the range of 400°–800° C, in a first condensing stage cooling said raw gas to a temperature in the range of 150°–220° C and to 3°–25° C below its dew point, said first condensing stage including a scrubbing and cooling zone for spraying condensate into said raw gas, withdrawing condensate from said first condensing stage and removing tar and dust from said condensate in a separation zone, recylcing condensate substantially free of dust and/or tar from said separation zone to said scrubbing and cooling zone, conducting the raw gas from said first condensing stage directly to a second condensing stage, withdrawing condensate from said second condensing stage and dephenolizing and purifying it separately from the condensate from the first condensing stage, said dephenolized and purified condensate from the second condensing stage containing a lower amount of salts than the condensate recycled to the scrubbing and cooling zone.

4,031,031

METHOD FOR TREATING CATALYST USED FOR CATALYTIC REACTIONS OF HYDROCARBONS AT THE TIME OF CATALYST REMOVAL

Kineo Yamaguchi, Urawa; Katsuhiko Kawakami, and Yukimasa Nakamoto, both of Kurashiki, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1975, Ser. No. 573,231

Claims priority, application Japan, Apr. 30, 1974, 49-47550

Int. Cl.² B01J *21/20*, *23/94*

U.S. Cl. 252—414 **10 Claims**

1. A method of treating a catalyst used in the desulfurization or cracking of a hydrocarbon oil in a reactor, which comprises:

a. washing said catalyst by the addition of mineral oil followed by wetting said catalyst by the addition to the mineral oil in a concentration of at least about 0.1% by weight of the mineral oil of

i. an oleophilic surface active substance, or

ii. an oleophilic surface active substance and a chelating agent;

for a period of time sufficient to reduce dust scattering and to prevent spontaneous combustion of the catalyst upon removal and at a temperature of from about 20° to about 300° C;

followed by

b. removing the liquid present in the reactor; and

c. removing the thus-treated catalyst from the reactor.

10. A method of treating a catalyst used in the desulfurization or cracking of a hydrocarbon oil in a reactor, which comprises:

a. wetting said catalyst with

i. mineral oil and an oleophilic surface active substance in a concentration of at least about 0.1% by weight of the mineral oil, or

ii. mineral oil, and in a concentration of at least about 0.1% by weight of the mineral oil, a combination of an oleophilic surface active substance and a chelating agent;

for a period of time sufficient to reduce dust scattering and to prevent spontaneous combustion of the catalyst upon removal and at a temperature of from about 20° to about 300° C;

followed by

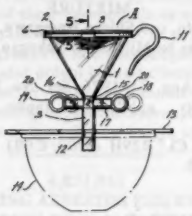
b. removing the liquid present in the reactor; and

c. removing the thus-treated catalyst from the reactor.

4,031,032
LIQUID PHASE SEPARATOR WITH VALVED OUTLET MEANS

Elizabeth S. Jablecki, 1422 Damon Court, SE., Rochester, Minn. 55901

Filed June 10, 1975, Ser. No. 585,475
Int. Cl.² B01D *23/28, 35/00*
U.S. Cl. 210—474 **6 Claims**



1. A device for separating immiscible liquids having different specific gravities and different visually determinable characteristics comprising a container of transparent material having an upper end portion and a lower end portion, said container having a relatively large opening in the upper end portion thereof for entry of immiscible liquids to be separated, said container lower end portion being of reduced cross section relative to the container upper portion and constituting an elongated conduit, said container having a relatively small discharge opening at the end of said elongated conduit remote from said container upper portion, valve means disposed within said elongated conduit, said elongated conduit being provided with transversely aligned openings defining bearings, said valve means extending through said aligned openings and being journalled therein for rotative movement about an axis perpendicular to the longitudinal axis, said valve means comprising an elongated cylindrical body having at least one transverse bore therethrough for disposition within said elongated conduit such that through movement along an axis perpendicular to the longitudinal axis of said device, said bore is movable between open and closed condition with respect to the flow of liquid from said container upper portion into and through said elongated conduit.

4,031,033
METHOD FOR PRODUCING POWDERED WETPROOFED MATERIAL USEFUL IN MAKING GAS-DIFFUSION ELECTRODES

Evgueni Bogdanov Budevski; Iliya Dimitrov Iliev; Anastasiya Rostislavova Kaisheva; Sergei Sergeev Gamburtzev, and Elena Borisova Vakanova, all of Sofia, Bulgaria, assignors to ZLEHIT pri BAN, Sofia, Bulgaria

Continuation-in-part of Ser. No. 486,785, July 9, 1974, abandoned, which is a continuation of Ser. No. 235,063, March 15, 1972, abandoned. This application May 30, 1975, Ser. No. 582,475
Claims priority, application Bulgaria, Mar. 29, 1971, 17175
Int. Cl.² H01M *4/08;* **H01B** *1/06*
U.S. Cl. 252—511 **3 Claims**

1. A method of producing a powdered wetproofed material useful for the production of gas-diffusion electrodes, the method comprising the steps of (1) combining an aqueous suspension of a powder consisting of electrochemically inactive, electrically conductive micropore-free grains consisting of carbon black in an amount between 1 and 5 percent by total weight of said aqueous suspension, with an aqueous dispersion of a high molecular weight polyolefin wetproofing agent consisting of polytetrafluoroethylene, said aqueous dispersion of said polyolefin including a dispersion stabilizer, (2) mixing at ambient temperature until the resulting mixture is homogenized and (3) removing the liquid phase by filtration, drying and disintegrating the obtained solids, removing the stabilizer from the solids by heating, and again disintegrating said solids, thereby obtaining the powdered wetproofed material.

4,031,034
ALTERING PERFUME GREEN NOTES USING TRITHIOACETONE

Richard Arnold Wilson, Westfield; Ira Katz, West Long Branch; Manfred H. Vock, Locust, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 528,461, Nov. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 166,683, July 28, 1971, abandoned. This application Mar. 1, 1976, Ser. No. 662,819
Int. Cl.² C11B *9/00*
U.S. Cl. 252—522 **2 Claims**

1. A process for altering, modifying or enhancing the crushed-leaf notes and leafy green notes of a perfume or a cologne which comprises adding thereto from 0.05% up to 10% by weight of trithioacetone.

4,031,035
POLYURETHANE-AMIDE RESINS BASED UPON ISOCYANATE TERMINATED PREPOLYMERS OF BIS-(2-HYDROXYETHYL)TEREPHTHALATE

Arthur M. Reader, Waynesboro, Va., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 506,082, Sept. 16, 1974, Pat. No. 3,969,394. This application Feb. 27, 1976, Ser. No. 662,276
Int. Cl.² C08G *18/10, 18/34*
U.S. Cl. 260—2.5 AM **10 Claims**

8. A process for producing a polyurethane cellular material which comprises reacting a polycarboxylic acid compound with a polyisocyanate compound, wherein said polycarboxylic acid corresponds to the formula:

$$R_1(CO_2H)_{n+1}$$

where R_1 is a polyvalent organic radical containing between 2 and 12 carbon atoms; and n is a positive integer having a value of 1 to about 5, and wherein said polyisocyanate compound is a product of the reaction of bis(2-hydroxyethyl) terephthalate with a molar excess of an isocyanato-derivative corresponding to the formula:

$$R(NCX)_{m+1}$$

where R is a polyvalent organic radical containing between 2 and about 22 carbon atoms; X is an oxygen or sulfur atom; and m is a positive integer having a value of 1 to about 5; and wherein the viscosity of the reaction mixture is sufficiently high to entrap the gas evolving from the condensation reaction of the polycarboxylic acid with the polyisocyanate.

4,031,036
USE OF BIS(FLUOROALIPHATICSULFONYL) IMIDES IN CATIONIC POLYMERIZATION

Robert J. Koshar, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 9, 1975, Ser. No. 585,101
Int. Cl.² C08F *4/00;* **C08G** *2/06, 59/68, 65/10*
U.S. Cl. 260—2 N **22 Claims**

1. The process comprising the steps of mixing monomer selected from the group consisting of epoxy compound or resin, vinyl ether, N-vinyl compound, aziridine, vinyl aromatic and acetal with a bis(fluoroaliphaticsulfonyl)imide or salt thereof as a catalyst for polymerization thereof, and polymerizing said monomer.

4,031,037
THREE-DIMENSIONAL POLYMERIC GEL MATERIALS CONTAINING PHOSPHORIC ACID RESIDUES CAPABLE OF DISSOCIATION AND A METHOD FOR THEIR PREPARATION

Jaroslav Kalal, No. 135 Belohorska, Prague 6; Jiri Coupek, No. 1580 Pankrac, Prague 4; Svatopluk Pokorny, No. 17 Mrstikova, Prague 10; Frantisek Svec, No. 2042 Bendlova, Kladno, and Karel Bouchal, No. 6 N. Belojanise, Prague 5, all of Czechoslovakia

Continuation-in-part of Ser. No. 500,080, Aug. 23, 1974, abandoned. This application Feb. 20, 1975, Ser. No. 551,271

Claims priority, application Czechoslovakia, Aug. 29, 1973, 6008/73

Int. Cl.² C08F *8/40*

U.S. Cl. 260—2.2 R **13 Claims**

1. An organic polymeric composition prepared by directly reacting a macroporous copolymer matrix of (a) an acrylic or methacrylic acid ester monomer containing at least one functional hydroxyl group or an acrylic or methacrylic acid derivative monomer containing at least one epoxide group and (b) a cross-linking monomer containing at least two double bonds, said cross-linking monomer (b) being at least 10% by weight based on the total weight of the monomers, with a member selected from the group consisting of phosphoric acid, phosphorus pentoxide, phosphorus halide, phosphorus oxyhalide and complexes of phosphoric acid with strong Lewis acids, at a temperature of 0° to 110° C. in the presence of an organic solvent selected from the group consisting of dry benzene, toluene and xylene for at least 2 hours to covalently bond phosphoric acid moieties to said hydroxyl or epoxide groups.

4,031,038
WATER INSOLUBLE CHELATE EXCHANGE RESINS HAVING A CROSSLINKED POLYMER MATRIX AND PENDANT THERETO A PLURALITY OF METHYLENEAMINOPYRIDINE GROUPS

Robert R. Grinstead, Walnut Creek, and Wilmonte A. Nasutavicus, Lafayette, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

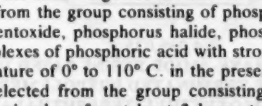
Filed June 16, 1975, Ser. No. 587,185

Int. Cl.² B01D *15/04*; C08F *26/06*

U.S. Cl. 260—2.2 R **20 Claims**

1. A water-insoluble chelate exchange resin having a cross-linked polymer matrix and pendent thereto a plurality of methyleneaminopyridine groups of Formula III:

(III)



wherein M is the matrix resin;

Y is H or C_1–C_4 alkyl;

Q is

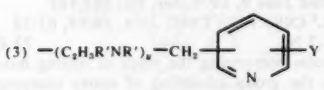
1. —-CH_2-;
2. $-(C_2H_3R'NR')_x-CH_2-$ where each R′ is H or CH_3 and x is 1 or 2; or
3. —, —NH—, $-C_2H_4-$; and

each R is

1. H, C_1–C_4 alkyl, or C_2–C_4 hydroxyalkyl;

and when Q is $-CH_2-$, R can also be:

2. allyl, benzyl or o-hydroxybenzyl;

(3) 

wherein each R′ is H or CH_3 and y is 0 or 1;

4. $-(CH_2)_mOY$ where m is 2 or 3;
5. $-C_2H_3R'NR_1R_2$ where R′ is H or CH_3, R_1 is H, C_1–C_4 alkyl, C_2–C_4 hydroxyalkyl, phenyl or benzyl, and R_2 is H, C_1–C_4 alkyl or C_2–C_4 hydroxyalkyl;
6. $-C_2H_3SR'''$ where R‴ is C_1–C_4 alkyl;
7. $-C_nH_{2n}COOY$ where n is 1 or 2;
8. $-C_nH_{2n}SO_3^-$ where n is 1 or 2; or
9. $-CH_2Z$ where Z is $-CONH_2$ or $-NHCONH_2$.

4,031,039
METHOD FOR TREATING WASTE HIGH-POLYMER MIXTURE

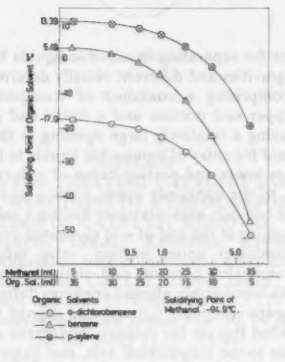
Yoshiaki Mizumoto, and Shigeo Hasegawa, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1976, Ser. No. 716,585

Claims priority, application Japan, Sept. 2, 1975, 50-105612

Int. Cl.² B29H *19/00*; C08J *11/04*

U.S. Cl. 260—2.3 **7 Claims**



1. A method for treating a waste high-polymer mixture by fractionating the mixture consisting essentially of five groups of high polymers, comprising polyolefinic, polystyrenic, polyvinyl-chloride, thermosetting, and natural high polymers, taking advantage of their dissimilar solubilities in different organic solvents, which comprises bringing the mixture into contact with o-xylene, p-xylene, or m-xylene, the isomers being used either singly or in a combination of two or more, at a temperature between 5° and 50° C to dissolve and fractionate the polystyrenic high polymers, and then at a temperature between 90° and 150° C to dissolve and fractionate the polyolefinic high polymers, and finally dissolving and fractionating the polyvinyl chlorides by heating the remainder in at least one solvent selected from the group consisting of tetrahydrofuran, cyclohexanone, dioxane, and methylethylketone, at a temperature between 5° and 60° C, whereby said waste mixture is fractionated into four groups of high polymers, comprising polyolefinic, polystyrenic, polyviny-chloride, and a mixture of thermosetting and natural high polymers.

4,031,040
POLYURETHANES PREPARED FROM HYDROXYMETHYL ISOCYANURATES

Marinus J.A.M. Den Otter, Munstergeleen; Anne Te Nijenhuis, and Albert A. Van Geenen, both of Brunssum, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed June 20, 1975, Ser. No. 588,944

Claims priority, application Netherlands, June 20, 1974, 7408244; June 12, 1975, 7506981

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AW **19 Claims**

1. Process for preparing polyurethanes containing isocyanurate rings from a polyol containing one or more isocyanurate rings, this process being characterized in that said polyol

selected from the group consisting of tris-hydroxymethyl isocyanurate, bis-hydroxymethyl isocyanurate, mixed hydroxymethylhydroxy ($C_2 - C_6$ alkyl) isocyanurates, derivatives of bis- or tris-hydroxymethyl isocyanurate or a mixed hydroxymethyl-hydroxy ($C_2 - C_6$ alkyl) isocyanurate in which one or more hydroxymethyl groups have been replaced by hydroxypolyoxymethylene groups containing 2–4 oxymethylene groups, oligomers obtained by intercondensation of the above-mentioned compounds during the preparation of the above-mentioned compounds, derivatives of said compounds in which the hydroxy groups are partly etherified and/or esterified, and mixtures of these compounds, is made to react with an organic polyisocyanate or a mixture of polyisocyanates, the ratio of isocyanate groups of said polyisocyanate or mixture to hydroxy groups of said polyol being between 1.0 and 1.5, in the presence of one or more compounds accelerating the reaction of isocyanate groups with hydroxyl groups, wherein said polyol contains at least 2% by weight of solvent.

4,031,041
CLOTH COMPRISING ASBESTOS FIBERS AND METHOD OF PRODUCING SAID CLOTH

Pierre Bouy, Enghien; Michel Juillard, Orsay, and Jean-Luc Bourgeois, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed July 31, 1975, Ser. No. 600,218

Claims priority, application France, July 31, 1974, 74.26563

Int. Cl.² B29D *27/00*

U.S. Cl. 260—2.5 M **21 Claims**

1. A method of obtaining a sheet comprising asbestos fibers and a fluorocarbon polymeric resin, which process comprises, in a first stage asbestos fibers and at least one solid particulate mineral filler substance are mixed at substantially high speed of at least about 800 R.P.M. in the dry state, in a second stage at least one fluorocarbon polymeric resin latex is added and mixed with the resulting dry mixture, and finally a sheet is then formed from the resulting mixture.

10. A method of obtaining a micro-porous membrane according to claim **1**, wherein at least one of the mineral filler substances introduced during the first stage is a pore-forming agent, and in that the pore-forming agent is removed at a later stage.

19. A novel microporous sheet wherein it is obtained by the method of claim **10**.

4,031,042
ORGANOSILICONE POLYMERS AND POLYESTER URETHANE FOAM PRODUCED THEREWITH

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

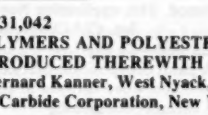
Division of Ser. No. 457,510, April 3, 1974, Pat. No. 3,954,824. This application Aug. 27, 1975, Ser. No. 608,222

The portion of the term of this patent subsequent to June 3, 1992, has been disclaimed.

Int. Cl.² C08G *22/44*

U.S. Cl. 260—2.5 AH **14 Claims**

1. A solution composition comprising components (1), (2), (3) and (4) wherein: component (1) comprises a siloxane-polyoxyalkylene block copolymer having the average composition,



wherein: R is alkyl having from 1 to 10 carbon atoms, R° is bivalent alkylene of from 2 to 12 carbon atoms, E is an organic-capped polyoxyalkylene block, at least 75 weight percent of the polyoxyalkylene content of the copolymers being constituted of oxyethylene, *q*is zero or one, *x* is zero or a positive number having an average value up to about 20, *y* has an average value from about 2 to about 20, and *z* has an average value from about 2 to about 30, provided the average weight of said copolymers attributable to said polyoxyalkylene blocks is from about 50 to about 85 weight percent; component (2) is a water soluble organic acidic component present in said solution in an amount from about 5 to about 90 parts by weight per 100 parts by weight of said block copolymer; component (3) is a water soluble, silicon-free organic surfactant; and component (4) is a water soluble glycol; the combined total weight of components (3) and (4) present in said solution ranging from about 5 to about 90 parts by weight per 100 parts by weight of said block copolymer.

4,031,043
PROCESS FOR THE MANUFACTURE OF FOAMS FROM EPOXIDE RESINS

André Schmitter, Hegenheim, France, and Wolfgang Seiz, Pfeffingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 21, 1975, Ser. No. 597,607

Claims priority, application Switzerland, July 29, 1974, 10466/74

Int. Cl.² C08J *9/00*

U.S. Cl. 260—2.5 EP **14 Claims**

1. In the process for the manufacture of foams having a density of 0.2 to 0.8 g/cm³, from epoxide resins and amine curing agents, the improvement which comprises adding to the warmed mixture to be cured and foamed, an organic sulphohydrazide as the blowing agent, an organic compound which contains amide groups obtained by reacting a carboxylic acid with an amine, and acetic acid salt of a metal of group II*a* or II*b* of the Periodic Table.

4,031,044
POLYETHER BASED, HIGH RESILIENT POLYURETHANE FOAM

Wallace G. Joslyn, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 461,186, April 15, 1974, abandoned. This application Nov. 11, 1976, Ser. No. 740,992

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AH **7 Claims**

1. A method of preparing a one-shot polyether based, high resilient polyurethane foam which method includes the steps of

I. preparing a homogeneous mixture consisting essentially of

A. 100 parts by weight of a base polyether polyol selected from a group consisting of

i. a polyether triol containing at least 40 mole percent primary hydroxyl groups and having a molecular weight in the range of 2,000 to 8,000 grams per mole, and

ii. a mixture of (i) and an additional polyether polyol having an average of at least two hydroxyl groups, wherein said polyether polyol is present in the mixture (ii) to at least 40 weight percent of the total polyether polyol content of (ii),

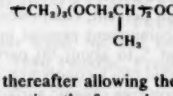
B. a sufficient amount of organic polyisocyanate to give from 90 to 120 percent, on a stoichiometric basis, of isocyanate radicals for each hydroxyl radical in the composition,

C. a catalytic amount of a catalyst for the production of the high resilient polyurethane foam,

D. 1 to 10 parts by weight of a blowing agent,

E. a foam stabilizing amount of a copolymer of the general formula

wherein h has an average value of about 3, d has an average value of about 1, and G is essentially



II. thereafter allowing the mixture to foam, and
III. curing the foamed composition.

4,031,045

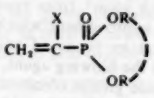
FOAMABLE PVC RESIN FORMULATION, PROCESS FOR FOAMING, AND PRODUCT THEREOF

Jagadish Chandra Goswami, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed July 28, 1976, Ser. No. 709,562
Int. Cl.² C08J 9/10
U.S. Cl. 260—2.5 R **8 Claims**

1. A foamable resin formulation which consists essentially of:

a. a copolymer consisting essentially of from about 70% to about 90%, by weight, of vinyl chloride, from about 5 to 15%, by weight, of vinyl acetate and about 5% to 15% by weight of a bis(hydrocarbyl)vinylphosphonate of the formula



wherein X is selected from the group consisting of hydrogen, halogen, cyano, phenyl and C_1–C_{18} alkyl and where R and R′ are C_1–C_{12} alkyl groups;

b. an effective amount of a plasticizer selected from the group consisting of polyester plasticizers made from the reaction of a dibasic acid and dihydric alcohol, epoxy plasticizers made by the epoxidation of vegetable oils or fatty acids and mixtures thereof for plasticization of the copolymer; and

c. an effective amount for expansion of a 4,4′-oxybis (benzene sulfonyl hydrazide) blowing agent.

4,031,046

EXOTHERMIC LINING FOR METALLURGICAL PURPOSES AND METHOD OF MAKING THE SAME

Julianna Tisza, Zurich, Switzerland, assignor to Firma TIDO Chemisch-technische Produkte GmbH, Vienna, Austria

Filed Mar. 31, 1975, Ser. No. 563,586
Claims priority, application Austria, Apr. 2, 1974, 2723/74
The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.
Int. Cl.² C08L 1/02, 3/02
U.S. Cl. 260—17.2 **21 Claims**

1. A material for making an exothermic lining, comprising, by weight,

40 to 60%	aluminum dross,
1 to 12%	fibrous filler,
3 to 6%	binder,
0.01 to 1%	wetting agent selected from the group consisting of anion-active compounds, non-ionic compounds, and mixtures thereof,
7 to 25%	aluminum powder and/or aluminum chips,
3 to 15%	iron oxide and/or manganese dioxide, and
not exceeding 6%	cryolite.

4,031,047

NON-AQUEOUS STOVING LACQUERS CONTAINING ε-CAPROLACTAM AS REACTIVE DILUENT

Rolf Dhein, Krefeld; Karl Zabrocki, Buettgen; Wolfgang Beer, and Rolf Küchenmeister, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 12, 1975, Ser. No. 604,013
Claims priority, application Germany, Feb. 7, 1975, 2505246
Int. Cl.² C09D 3/52, 3/66
U.S. Cl. 260—21 **1 Claim**

1. A non-aqueous stoving lacquer containing

a. 35–89% by weight, based on the sum of components (a) to (c), of a polyester with an oil content of from 0 to 50% by weight, based on component (a), an acid number of from 5 to 50, an OH number of from 70 to 450 and an average molecular weight determined by vapor pressure osmosis of from 300 to 6000;

b. 10–40% by weight, based on the sum of components (a) to (c), of an aminoplast resin with an average molecular weight determined by vapor pressure osmosis of from 120 to 1250 and

c. 1 to 25% by weight, based on the sum of components (a) to (c), of ε-caprolactam.

the molar ratio of caprolactam to aminoplast resin being from 0.001:1 to 7:1.

4,031,048

PAINT COMPOSITION FOR MARKING PAVED SURFACES

Reynold E. Holmen, White Bear Lake, and Stanley J. Olander, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 239,712, March 30, 1972, abandoned. This application Nov. 13, 1972, Ser. No. 306,688
Int. Cl.² C09D 3/64, 3/70, 5/22
U.S. Cl. 260—22 CQ **10 Claims**

1. A paint composition that rapidly congeals to traffic-bearing condition when sprayed at an elevated temperature onto a paved surface, comprising

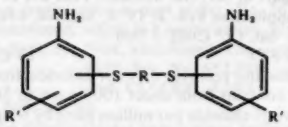
1. a paint vehicle that includes a nonvolatile organic film-forming paint binder and that
   a. is a liquid at normal ambient temperatures of 40° F to 110° F, but
   b. forms a durable adherent nontacky paint film when applied as a thin coating and exposed to said normal ambient temperatures;
2. a film-forming thermoplastic substantially neutral polyamide reaction product of diphenolic acid, polycarboxylic acid and polyamine, diphenolic acid comprising at least one weight-percent of the ingredients of the reaction product and the reaction product
   a. comprising at least about 5 weight-percent of the nonvolatile organic ingredients of the paint composition,
   b. being a solid at said normal ambient temperatures,
   c. being substantially insoluble in the paint vehicle at said normal ambient temperatures, and
   d. forming an at least substantially dissolved sprayable liquid blend with the paint vehicle at an elevated temperature above 110° F; and
3. pigments in an amount sufficient to color the paint composition.

4,031,049
POLYURETHANE CROSS-LINKING AGENTS

Frank N. Hirosawa, Monterey Park, and Ming H. Lee, Glendale, both of Calif., assignors to Furane Plastics, Inc., Los Angeles, Calif.

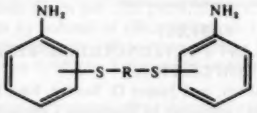
Continuation-in-part of Ser. No. 60,742, Aug. 3, 1970, abandoned. This application Apr. 22, 1974, Ser. No. 462,811
Int. Cl.² C08G *18/32*
U.S. Cl. 260—2.5 AM 28 Claims

1. The process of making a highly resilient cellular polyurethane which comprises reacting a polyalkylene polyol having reactive hydrogen atoms as determined by the Zerewitinoff method, an organic poly-functional isocyanate, water, and a gel catalyst, said reduction being carried out in the presence of a blowing catalyst and a cross-linking agent comprising at least one compound selected from those of the formula:



wherein R is selected from the group consisting of a hydrocarbon and a hydrocarbon bearing a non-reactive substituent, and R′ is selected from the group consisting of hydrogen, a hydrocarbon and a hydrocarbon bearing a non-reactive substituent.

24. A process of making an elastomeric polyurethane plastic which comprises mixing an organic polyisocyanate with a mixture of an organic compound having reactive hydrogen atoms as determined by the Zerewitinoff method having a molecular weight of at least about 500, and 0.005 to 10 parts by weight per 100 parts by weight of polyol of at least one compound of the formula:



wherein R is selected from the group consisting of a hydrocarbon and a hydrocarbon bearing a non-reactive substituent.

4,031,050
CATIONIC ELECTRODEPOSITABLE COMPOSITIONS OF BLOCKED NCO AND ACID SALT OF ADDUCT OF AMINE AND POLYEPOXIDE

Robert D. Jerabek, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 400,088, Sept. 24, 1973, abandoned, which is a division of Ser. No. 193,590, Oct. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 47,917, June 19, 1970, Pat. No. 3,799,854. This application Feb. 5, 1975, Ser. No. 547,275
Int. Cl.² C08G *18/80*; C08J *3/06*; C08L *63/00*
U.S. Cl. 260—29.2 TN 6 Claims

1. A composition comprising:
A. a synthetic hydroxyl-containing adduct which is the reaction product of a primary or secondary amine and a polyepoxide, said adduct being solubilized with acid to provide cationic groups in said adduct,
B. a blocked polyisocyanate stable at ordinary room temperature in the presence of said adduct and reactive with said adduct at elevated temperatures.

4,031,051
HYDROLYZED REACTION PRODUCT OF A POLYEPOXIDE WITH A PHENOLIC COMPOUND HAVING A GROUP HYDROLYZABLE TO A CARBOXYL AND CURING AGENT THEREFOR

Rostyslaw Dowbenko, Gibsonia, and Joseph R. Marchetti, Greensburg, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 497,004, Aug. 13, 1974, Pat. No. 3,960,795. This application Feb. 9, 1976, Ser. No. 656,542
Int. Cl.² C08G *59/16*; C08J *3/06*; C25D *13/06*
U.S. Cl. 260—29.2 TN 8 Claims

1. An aqueous composition comprising:
A. the solubilized reaction product of
1. a polyepoxide having an epoxy equivalency greater than 1.0, and
2. a compound containing at least one phenolic hydroxyl group and containing at least one group hydrolyzable to a carboxyl group and having the following structural formula:

$$(HO)_n R-(W)_m$$

wherein *n* and *m* are integers of at least 1, wherein R is an organic radical containing at least one aryl group and wherein at least one of the hydroxyl groups is attached to at least one of the aryl groups of R, and wherein W is a group hydrolyzable to a carboxyl group, and
B. a curing agent selected from the class consisting of aminoplast resins, phenolic resins and blocked or semi-blocked polyisocyanates and combinations thereof.

4,031,052
AQUEOUS STOVING LACQUER CONTAINING ε-CAPROLACTAM AS A REACTIVE DILUENT

Rolf Dhein; Jochen Schoeps, and Rolf Kuchenmeister, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 12, 1975, Ser. No. 604,012
Claims priority, application Germany, Aug. 17, 1974, 2439548
Int. Cl.² C08G *51/24*; C09D *3/52*
U.S. Cl. 260—29.4 R 3 Claims

1. Aqueous stoving lacquers based on a mixture of
A. polymers which contain carboxyl groups or salts thereof and hydroxyl groups,
B. aminoplast resins, and
C. a reactive diluent which is miscible with water, characterised in that the reactive diluent used contains ε-caprolactam.

4,031,053
PROTECTIVE COLLOIDS FROM ALCOHOLYSIS PRODUCTS OF POLYALCOHOLS AND POLYACRYLATE ESTERS

Rex L. Bunkley, Kingsville, Tex., and Thomas M. Powanda, Middlesex, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,581
Int. Cl.² C08L *31/04*
U.S. Cl. 260—29.6 RW 11 Claims

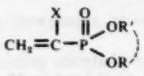
1. In the process for preparing a stable dispersion of polymers of ethylenically unsaturated monomers which comprises reacting said monomers in water in the presence of a protective colloid and an anionic or nonionic surfactant or mixture thereof with a free radical polymerization catalyst under polymerization conditions, the improvement of which comprises using as the protective colloid a polymer of the transesterification product of 1 to about 3 moles of a 2-4 hydroxy group containing alcohol, and about 1 mole of a tri- or tetra-acrylate or methacrylate ester of a tri- or tetra- polyol.

4,031,054
FLAME-RETARDANT BINDER COMPRISING VINYLIDENE HALIDE-BIS(HYDROCARBYL)VINYL PHOSPHONATE POLYMER LATICES BLENDED WITH ANTIMONY OXIDE AND CHLOROPARAFFIN

Jung Il Jin, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 398,624, Sept. 19, 1973, Pat. No. 3,904,570. This application June 4, 1975, Ser. No. 583,812
Int. Cl.² C08L *27/00*
U.S. Cl. 260—29.6 T **10 Claims**

1. A flame retardant polymer latex composition comprising: (1) from about 30% to about 95%, by weight, of a polymer which consists essentially of: from about 20% to about 85%, by weight of at least one halogen-containing α,β-ethylenically unsaturated monomer; from about 10% to about 75%, by weight of at least one bis(hydrocarbyl) vinylphosphonate of the formula:



in which X is selected from the group consisting of hydrogen, halogen, cyano, phenyl, alkyl of from 1 to 18 carbon atoms and the grouping

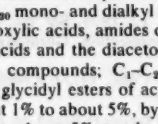
and each R and R′ are hydrocarbyl of from 1 to 18 carbon atoms; from about 5% to about 35%, by weight of at least one third comonomer selected from the group consisting of alpha olefins, vinyl esters of carboxylic acids, C_1–C_{20} alkyl esters of acrylic and methacrylic acid, ethylenically unsaturated dicarboxylic acids, anhydrides of ethylenically unsaturated dicarboxylic acids, C_1–C_{20} mono- and dialkyl esters of ethylenically unsaturated dicarboxylic acids, amides of ethylenically unsaturated carboxylic acids and the diacetone derivatives of said amides; vinyl aryl compounds; C_1–C_{20} alkyl vinyl ethers; C_4–C_{20} dienes, and glycidyl esters of acrylic and methacrylic acid; and from about 1% to about 5%, by weight of N-methylol crylamide; (2) from about 5% to about 25% by weight of antimony oxide; and (3) up to about 45%, by weight of chloroparaffin.

4,031,055
METAL COMPOUND STABILIZED COATING COMPOSITIONS

John A. Dupont, Glenside; Walter Kooch, Feasterville, and Joseph D. Scott, Philadelphia, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 139,877, May 3, 1971, abandoned. This application May 28, 1975, Ser. No. 581,592
Int. Cl.² C09D *3/74, 3/80, 5/14*
U.S. Cl. 260—29.6 MM **14 Claims**

1. A coating composition which comprises an aqueous dispersion of a vinyl or acrylic emulsion polymer having a pH greater than 9.0, a mildew-controlling amount of an isothiazolone of the formula



wherein Y is a hydrogen atom, a $(C_1$–$C_{18})$ alkyl group, a $(C_6$–$C_{10})$ aryl group, or a $(C_7$–$C_{10})$ aralkyl group;

R is a hydrogen atom, a halogen atom, or a $(C_1$–$C_4)$ alkyl group,

R′ is a hydrogen atom, a halogen atom, or a $(C_1$–$C_4)$ alkyl group, or

R and R′ can be taken together to complete a benzene ring, optionally substituted with one or more halogen atoms, nitro groups, $(C_1$–$C_4)$ alkyl groups, cyano groups, or $(C_1$–$C_4)$ alkoxy groups, and a stabilizing amount of a metallic compound of zinc, molybdenum, copper (cuprous, cupric), lead or mercury.

4,031,056
PROCESS FOR THE REMOVAL OF VINYL CHLORIDE FROM LATEXES CONTAINING POLYVINYL CHLORIDE

Piyush J. Patel, Somerville, and William Miringoff, Willingboro, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 553,869, Feb. 27, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 654,251
Int. Cl.² C08L *27/06*
U.S. Cl. 260—29.6 PT **13 Claims**

1. The process for the removal of vinyl chloride from an aqueous latex that contains from about 1000 parts to 50,000 parts by weight of vinyl chloride per million parts by weight of latex and from 5% to 50% by weight of a polymer selected from the group consisting of polyvinyl chloride and copolymers of vinyl chloride with at least one monomer copolymerizable therewith, said polymer being present in the latex as particles ranging in size from 0.01 micron to 2 microns, that comprises the steps of

a. maintaining the latex at a temperature in the range of 20° C. to 70° C.,

b. passing a stream of the latex through a rapidly-rotating perforated disc to form a fine spray of minute droplets of the latex,

c. passing said spray into an evacuated chamber that is maintained at a pressure below about 400 torr, and

d. recovering from said evacuated chamber an aqueous latex of reduced vinyl chloride content.

4,031,057
LIQUID AMINOPLAST POLYFUNCTIONAL RESIN COMPOSITIONS

Frank J. Hahn, Wilbraham, and James O. Santer, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 28, 1975, Ser. No. 572,037
Int. Cl.² C08K *5/16*
U.S. Cl. 260—32.6 R **7 Claims**

1. A composition of matter wherein at least 80 volume percent of the organic moiety comprises a thermosettable solution of a N,N′-bis(alkoxymethyl)uron and a polyfunctional resin wherein the solution viscosity at 25° C. is less than 1000 centipoises, wherein the alkyl radicals of the alkoxy groups of the uron are selected from the group consisting of C_1 to C_8 alkyl radicals and wherein the polyfunctional resin contains sufficient alcoholic hydroxyl and carboxyl groups to provide a functionality greater than 2 and has a number average molecular weight in the range of 300 to 5000.

4,031,058
HOT MELT SEALANTS

Richard Joseph Cella, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 570,721, April 23, 1975, abandoned. This application Dec. 19, 1975, Ser. No. 642,234
Int. Cl.² C08K *5/02, 5/10;* **C08F** *18/14*
U.S. Cl. 260—33.8 UA **7 Claims**

1. A hot melt adhesive comprising

a. 100 parts by weight of a random ethylene/methyl acrylate/maleic acid monoethyl ester polymer in which polymerized methyl acrylate units are present in the

amount of about 50–60 wt. %, in which polymerized maleic acid monoethyl ester units are present in the amount of about 3–5 wt. %, and in which polymerized ethylene units are present in the amount of about 35 to 47 wt. %, the maleic acid monoethyl ester units are from 5 to 50% neutralized with ions selected from the class consisting of sodium ions and potassium ions;

b. about 50 to 150 parts by weight of an inorganic filler;

c. about 50 to 250 parts by weight of a tackifying resin, and

d. about 10 to 50 wt. %, based on the weight of the tackifying resin, of a plasticizer.

4,031,059

LOW DENSITY ABLATOR COMPOSITIONS

Eric L. Strauss, Englewood, Colo., assignor to Martin Marietta Corporation, Denver, Colo.

Continuation of Ser. No. 435,234, Jan. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 243,954, April 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 763,893, Sept. 30, 1968, abandoned. This application Jan. 28, 1976, Ser. No. 652,906

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **46 Claims**

1. A low density ablator composition having a density of not greater than 0.25 g/cc for providing ablation protection comprising:

100 parts by volume of a siloxane elastomer resin selected from the group consisting of methyl-phenyl-vinyl polysiloxane, dimethyl polysiloxane and methyl-phenyl polysiloxane the viscosity of which is equal to or less than 10,000 centipoise; about 1600 to about 1800 parts by volume of a low density filler comprising about 600 to about 900 parts by volume ground cork sized from 0.0165 to 0.0331 inch per 100 parts of resin; from about 500 to 800 parts by volume of hollow silica or glass microspheres sized from 0.0030 to 0.0080 inch per 100 parts of resin; up to about 260 parts by volume of hollow phenolic resin microballoons sized from 0.0030 to 0.0080 inch per 100 parts of resin; up to about 6 parts by volume carbon fibers per 100 parts of resin; and, up to about 6 parts by volume of silica fibers per 100 parts of resin.

23. A low density ablator composition having a density not greater than 0.30 g/cc for providing ablation protection comprising:

100 parts by volume of a siloxane elastomer resin selected from the group consisting of methyl-phenyl-vinyl polysiloxane, dimethyl polysiloxane and methyl-phenyl polysiloxane the viscosity of which is equal to or less than 10,000 centipoise; about 1180 parts by volume of filler comprising about 1175 parts by volume silica or glass microspheres sized from 0.0030 to 0.0080 inch per 100 parts resin; and, from 6 parts silica fibers.

4,031,060

PROCESS OF PIGMENTING POLYAMIDES

Raymond Leo Hackert, Salisbury, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 17, 1976, Ser. No. 724,097

Int. Cl.² C08L *77/00*

U.S. Cl. 260—37 N **8 Claims**

1. In a polymerization process to form a pigmented polyamide from a nylon salt wherein an aqueous dispersion of a finely divided mineral pigment is added to the polymerforming reactants prior to completion of the polymerization, the improvement comprising preparing the dispersion by milling a concentrated slurry of the pigment in water in the presence of a dispersing agent to separate agglomerated pigment particles and mixing the milled slurry with a concentrated aqueous solution of a nylon salt to flocculate the pigment particles and with additional milling forming a flocculated dispersion containing from about 25 to 45% of the pigment.

4,031,061

RIGID POLYVINYL CHLORIDE COMPOSITIONS WITH HIGH HEAT-DEFLECTION TEMPERATURES

James L. Thomas, Hamilton Square, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Nov. 12, 1975, Ser. No. 631,112

Int. Cl.² C08K *3/26*

U.S. Cl. 260—42.29 **1 Claim**

1. A polyvinyl chloride molding composition consisting essentially of an intimate mixture of 10 to 50%, based on polyvinyl chloride weight, of a plasticizer consisting of from 85 to 100% by weight diallyl phthalate and 0 to 15% by weight of a polymerizable unsaturated glycol-polybasic acid polyester containing sufficient unsaturated acid so that it will thermoset when appropriately catalyzed with a vinyl polymerization catalyst, a polymerization catalyst for the diallyl phthalate and a stabilizer for the polyvinyl chloride, 40 to 100% by weight of finely divided ground limestone based on the combined weight of polyvinyl chloride and plasticizer, the remainder being a polyvinyl chloride of which at least 50% by weight is suspension grade, and such composition when molded and cured having heat-deflection temperatures in excess of 100° C.

4,031,062

POLYOLEFIN COMPOSITION AND PROCESS FOR PREPARING THE SAME

Kenzo Shirayama; Shinichiro Kita, and Masanori Fujimoto, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 287,167, Sept. 7, 1972, abandoned. This application Sept. 26, 1974, Ser. No. 509,591

Claims priority, application Japan, Sept. 14, 1971, 46-71375; Feb. 2, 1972, 47-12073

Int. Cl.² C08K *3/20*

U.S. Cl. 260—42.45 **7 Claims**

1. A process for preparing a polyolefin composition having high adhesive strength which comprises reacting together for 30 seconds to 10 minutes (1) a crystalline polyolefin, (20 at least one unsaturated acid component selected from the group consisting of unsaturated aliphatic carboxylic acids and anhydrides thereof and (3) magnesium oxide in an amount of from 5 to 20% by weight based on the weight of the polyolefin, at a temperature above the melting point of said polyolefin.

4,031,063

POLYESTER RESIN COMPOSITIONS

Anthony B. Conciatori, Chatham, and Robert W. Stackman, Morristown, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,748

Int. Cl.² C08G *63/18, 63/26, 63/60, 63/68*

U.S. Cl. 260—860 **3 Claims**

1. A chemically stable polyester block copolymer containing a recurring prepolymer condensate of equimolar proportions of 1,12-dodecanediol and $\alpha, \alpha, \alpha', \alpha'$-tetramethylpimelic acid, and containing a recurring prepolymer condensate of equimolar proportions of resorcinol and 2,3-dichloro-2,3-dimethylsuccinic acid.

4,031,064

AMINOPLAST CURING AGENTS

Karl Schnee, Maintal; Dieter Tichy, Frankfurt am Main, and Steffen Piesch, Oberursel, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed Apr. 18, 1975, Ser. No. 569,408

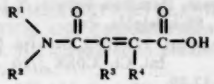
Claims priority, application Germany, Apr. 20, 1974, 2419124

Int. Cl.² C08G *12/26*

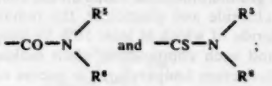
U.S. Cl. 260—67.6 R **12 Claims**

1. In the curing of uncured aminoplast condensation products with an acidic curing agent that under elevated tempera-

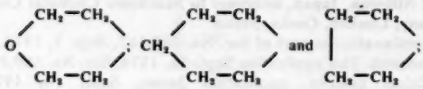
ture helps convert the condensation product to a cured resin, the improvement according to which the curing agent is



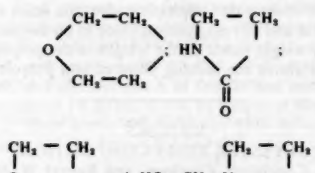
or a salt thereof
wherein
R^3 and R^4 are independently hydrogen or methyl;
R^1 is selected from the group consisting of hydrogen; alkyl with 1 to 20 carbon atoms which may also be substituted by hydroxy, phenoxy or alkoxy with 1 to 4 carbon atoms; phenyl or naphthyl which may be substituted by fluorine, chlorine, bromine or hydroxy;

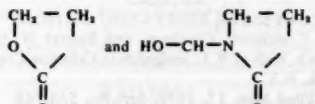


R^5 and R^6 being independently selected from the group consisting of hydrogen; alkyl with 1 to 4 carbon atoms; hydroxyalkyl with 1 to 4 carbon atoms and phenyl; or
R^5 and R^6 are selected from the group consisting of



R^2 and is selected from the group consisting of hydrogen; alkyl with 1 to 4 carbon atoms and hydroxyalkyl with 1 to 4 carbon atoms;
R^1 and R^2 together are selected from the group consisting of





4,031,065

MANUFACTURE OF THERMOPLASTIC POLYESTER MOLDING COMPOSITIONS OF HIGH VISCOSITY

Claus Cordes, Weisenheim, and Hans-Josef Sterzel, Dannstadt-Schauernheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 23, 1976, Ser. No. 660,137

Claims priority, application Germany, Mar. 6, 1975, 2509790; Nov. 22, 1975, 2552424

Int. Cl.² C08G *63/52*

U.S. Cl. 260—75 R **10 Claims**

1. A process for the manufacture of thermoplastic polyesters having a melt viscosity of more than 6,000 poise, as measured at 250° C, and having a relative viscosity of more than 1.6, as measured in a 2:1 mixture of phenol and o-dichlorobenzene at 25° C, by polycondensation, in the melt, of aliphatic and/or cycloaliphatic diols with dicarboxylic acids and/or esters thereof, wherein the polycondensation is effected for at least some of the time at a temperature above 220° C and preferably above 230° C, and in the presence of from 0.1 to 10% molar of an aliphatic diol containing at least one olefinic double bond and/or of an aliphatic dicarboxylic acid containing at least one olefinic double bond or an ester thereof, the olefinic double bond not being directly adjacent to the carboxyl or ester groups.

10. Thermoplastic polyesters having a melt viscosity of more than 6,000 poise, as measured at 250° C, and a relative viscosity of more than 1.6, as measured on a 2:1 mixture of phenol and o-dichlorobenzene at 25° C, consisting of aliphatic and/or cycloaliphatic diols on the one hand and dicarboxylic acids or esters thereof on the other hand and from 0.1 to 10% molar of an aliphatic diol containing at least one olefinic double bond and/or of an aliphatic dicarboxylic acid containing at least one olefinic double bond or an ester thereof, the olefinic double bond not being directly adjacent to the carboxyl or ester groups.

4,031,066

FLEXIBLE POLYBUTADIENE RESIN COMPOSITION HAVING EXCELLENT ELECTRICAL PROPERTIES

Atsushi Mori, Ichihara, and Hiroo Muramoto, Chiba, both of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Mar. 4, 1975, Ser. No. 555,143

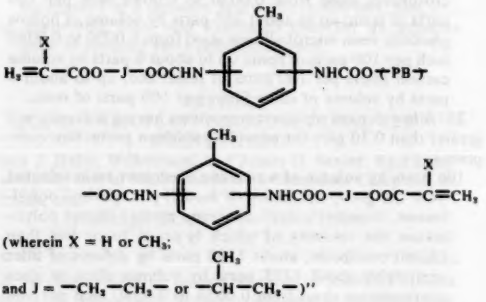
Claims priority, application Japan, Mar. 7, 1974, 49-25716

Int. Cl.² C08G *18/62*

U.S. Cl. 260—77.5 CR **2 Claims**

1. A flexible polybutadiene resin composition having 100 parts of (a), 5 to 120 parts of (b), and 50 to 500 parts of (c), where

a. is a thermosetting resin selected from the group consisting of the 2-hydroxy-alkyl-acrylate compound and the 2-hydroxy-alkyl-methacrylate compound having the following formula:



(wherein X = H or CH_3;

and J = $-CH_2-CH_2-$ or $-CH(CH_3)-CH_2-$)"

b. is a solid plasticizer petroleum resin composition selected from the polymer group consisting of petroleum resins produced from the mixture of olefinic compounds having 6 to 9 carbon atoms, hydrogenized petroleum resin having 6 to 9 carbon atoms, coumarone resin, indene resin and terepene resin; and,

c. is a vinyl monomer.

4,031,067

POLYTRIAZINES AND A PROCESS FOR THEIR PRODUCTION

Rudolf Sundermann, New Martinsville, W. Va.; Günther Rottloff, Cologne, and Ernst Grigat, Odenthal-Gloebusch, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed July 22, 1976, Ser. No. 707,552

Claims priority, application Germany, July 24, 1975, 2533126

Int. Cl.² C08G *18/00*, *18/71*

U.S. Cl. 260—77.5 R **2 Claims**

1. A mixture which can be converted into a high molecular

weight polymer of polytriazine structure which is substantially insoluble in solvents comprising

I. 30 to 70 mol percent of an N-cyanosulphonamide corresponding to the formula

$$A(SO_2-NH-CN)_n$$

wherein A is an aliphatic, cycloaliphatic or aromatic polyvalent radical and *n* is a number from 2 to 5,

II. 70 to 30 mol percent of an aromatic cyanic acid ester corresponding to the formula

$$Ar(OCN)_m$$

wherein Ar is an aromatic radical or an aromatic radical interrupted by bridge members, and *m* is a number from 2 to 5.

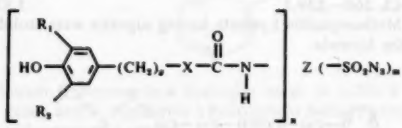
4,031,068

NON-MIGRATORY SULFONYL AZIDE ANTIOXIDANTS

Stephen E. Cantor, Cheshire, Conn., assignor to Uniroyal Inc., New York, N.Y.

Filed July 26, 1976, Ser. No. 708,676
Int. Cl.² C08K 5/43; C07C 117/00
U.S. Cl. 260—79.3 R 54 Claims

1. A sulfonyl azide antioxidant of the formula



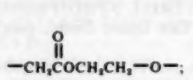
wherein:

R_1 is alkyl of from 1 to 12 carbon atoms, cyclohexyl, C_1–C_{10} alkyl-cyclohexyl, benzyl, or C_8–C_{11} alkylbenzyl;

R_2 is hydrogen or has one of the values assigned to R_1, with the proviso that R_1 and R_2 together have at least 2 carbon atoms;

g has a value of from 0 to 5;

X is a divalent bridge member selected from $-CH_2O-$, $-CH_2NH-$, or



m and *n* are each 1 or 2; and

Z is, depending on the values of *m and n*, a divalent, trivalent or tetravalent group selected from:

a. an alkylene group of from 2 to 5 carbon atoms when each of *m* and *n* is 1,

b. a divalent or trivalent benzene group when *n* is 1 and *m* is 1 or when *m* is 1 and *n* is 2, and

c. a divalent, trivalent or tetravalent group selected from naphthylene, diphenyl ether, and benzene groups when each of *m* and *n* is 1 or 2.

20. A method of protecting from oxidative deterioration a polymer, normally subject to oxidative deterioration, said polymer having a carbon-hydrogen bond, comprising mixing with the said polymer, in an amount effective to protect said polymer against oxidative deterioration, an antioxidant as in claim **1.**

4,031,069

TETRAPEPTIDES

Ernest D. Nicolaides; Francis John Tinney, and James Clark French, all of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Mar. 1, 1976, Ser. No. 662,381
Int. Cl.² C07C 103/52
U.S. Cl. 260—112.5 LH 9 Claims

1. A tetrapeptide represented by the formula

$$A\text{-}R_1\text{-}Ser(benzyl)\text{-}Tyr(benzyl)\text{-}R_2\text{-}R_3$$

wherein A is t-butoxycarbonyl, cyclohexylcarbonyl, benzyloxycarbonyl or p-nitrobenzyloxycarbonyl, R_1 is L-Trp, L-Thr(benzyl), L-Met or Gly; Tyr(benzyl) is L-Tyr(benzyl) or D-Tyr(benzyl), Ser(benzyl) is L-Ser(benzyl) or D-Ser(benzyl), R_2 is D-Ala, β-Ala, D-Leu or D-Val and R_3 is lower alkoxy, hydrazino, amino, lower alkylamino or di(lower alkyl-)amino.

4,031,070

TETRAPEPTIDES

Francis John Tinney, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Mar. 1, 1976, Ser. No. 662,405
Int. Cl.² C07C 103/52
U.S. Cl. 260—112.5 LH 4 Claims

1. A tetrapeptide represented by the formula

$$A\text{-}R_1\text{-}R_2\text{-}Ser(benzyl)\text{-}Tyr(benzyl)\text{-}R_3$$

wherein A is t-butoxycarbonyl, cyclohexylcarbonyl, benzyloxycarbonyl or p-nitrobenzyloxycarbonyl; R_1 is L-Trp or L-His(-benzyl), R_2 is L-Trp or L-His(benzyl), Ser(benzyl) is L-Ser(-benzyl) or D-Ser(benzyl), Tyr(benzyl) is L-Tyr(benzyl) or D-Tyr(benzyl), and R_3 is lower alkoxy, hydrazino, amino, lower alkylamino or di(lower alkyl)amino.

4,031,071

TETRAPEPTIDES

Eugene Leroy Wittle, and Ernest D. Nicolaides, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Mar. 1, 1976, Ser. No. 662,406
Int. Cl.² C07C 103/52
U.S. Cl. 260—112.5 LH 4 Claims

1. A tetrapeptide represented by the formula

$$A\text{-}Ser(benzyl)\text{-}Tyr(benzyl)\text{-}D\text{-}Ala\text{-}Leu\text{-}R_1$$

wherein A is t-butoxycarbonyl, cyclohexylcarbonyl, benzyloxycarbonyl or p-nitrobenzyloxycarbonyl; Ser(benzyl) is L-Ser(-benzyl) or D-Ser(benzyl), Tyr(benzyl) is L-Tyr(benzyl) or D-Tyr(benzyl), Leu is L-Leu or D-Leu, and R_1 is lower alkoxy, hydrazino, amino, lower alkylamino or di(lower alkyl)amino.

4,031,072

TETRAPEPTIDES

Alfred Campbell, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Mar. 1, 1976, Ser. No. 662,407
Int. Cl.² C07C 103/52
U.S. Cl. 260—112.5 LH 8 Claims

1. A tetrapeptide represented by the formula

$$A\text{-}Pro\text{-}Pro\text{-}Tyr(benzyl)\text{-}Ser(benzyl)\text{-}R_1$$

wherein A is t-butoxycarbonyl, cyclohexylcarbonyl, benzyloxycarbonyl or p-nitro-benzyloxycarbonyl; Pro is L-Pro or D-Pro, Tyr(benzyl) is L-Tyr(benzyl) or D-Tyr(benzyl), Ser(benzyl) is L-Ser-(benzyl) or D-Ser(benzyl), and R_1 is lower alkoxy, hydrazino, amino, lower alkylamino or di(lower alkyl-)amino.

4,031,073
MONOAZO PIGMENTS CONTAINING BARBITURIC ACID OR THIO- OR IMINO-DERIVATIVES THEREOF

Rudolf Mory, Dornach, and Stefan Hari, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

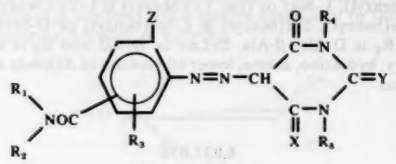
Continuation-in-part of Ser. No. 489,277, July 17, 1974, abandoned. This application Nov. 25, 1975, Ser. No. 635,210

Claims priority, application Switzerland, July 27, 1973, 10997/73

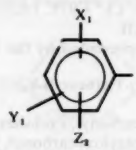
Int. Cl.[2] C09B *29/36;* **C09D** *11/00;* **D06P** *1/08, 3/00*

U.S. Cl. 260—154 **9 Claims**

1. A monoazo pigment of the formula



wherein R_1 denotes H, alkyl containing 1–4 atoms or an aryl radical of the formula



wherein X_1 denotes H, chloro, alkyl containing 1–4 C atoms, alkoxy containing 1–4 atoms, alkoxy carbonyl containing 2–5 C atoms, nitro, trifluoromethyl or cyano, Y_1 and Z_2 denote H, chloro or alkyl, R_2 denotes H, or alkyl containing 1–4 atoms, R_3 denotes H, chloro or alkyl containing 1–4 atoms, R_4 and R_5 denote H, alkyl contaning 1–4 C atoms, phenyl or phenyl substituted by chloro, alkyl containing 1–4 atoms or alkoxy containing 1–4 C atoms, X denotes O or imino, Y denotes O, S or imino, and Z denotes chloro, alkyl containing 1–4 C atoms, alkoxy containing 1–4 C atoms, or phenoxy, and wherein the carbonamide group is located in the m- or p-position to the azo group.

4,031,074
PROCESS FOR THE PREPARATION OF 11β-HYDROXY-18-ALKYL-ESTRANE COMPOUNDS

Hendrik Paul deJongh, Oss, and Cornelis Wilhelmus van Bokhoven, Berlicum, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed July 18, 1975, Ser. No. 597,271

Claims priority, application Netherlands, Sept. 2, 1974, 7411607

Int. Cl.[2] C07J *71/00, 5/00*

U.S. Cl. 260—239.55 C **34 Claims**

1. Process for the preparation of an 11β-hydroxy-18-alkyl steroid of the estrane series, the alkyl having 1 to 4 carbon atoms, which steroid may be substituted in the 3- and/or 17-position by an oxo group or a functional derivative thereof, in the 1, 2, 3, 4, 5, 6, 7, 15 and/or 16-position by hydroxy, acyloxy derived from an organic carboxylic acid having 1–18 carbon atoms, alkoxy having 1–2 carbon atoms, tetrahydropyranyloxy or trimethylsilyloxy in the 1, 6, 7, 9, 11α and/or 16-position with alkyl having 1–2 carbon atoms and in the 17α-position with saturated or unsaturated alkyl having 1–4 carbon atoms next to hydroxy, acyloxy derived from an organic carboxylic acid having 1–18 carbon atoms, alkoxy having 1–2 carbon atoms, tetrahydropyranyloxy or trimethylsilyloxy in 17β-position, and which may have a double bond in the 4,5-, 5,6-, or 5,10-position, which comprises reacting the corresponding 11β-hydroxy-13-methyl-gonane compound with an excess of an acyl hypoiodite and reacting the thus-obtained estrano-18, 11β-lactone with a compound RX, in which R = alkyl and X = MgBr or Li and thereafter reducing the thus-obtained 11β-hydroxy-18-alkyl-18-ketone to the 11β-hydroxy-18-alkyl-steroid of the estrane series.

4,031,075
ALKYLATED PREGNANES AND PROCESS FOR OBTAINING SAME

Gilbert Frederick Woods, Glasgow; Robert Thomas Logan, Lanark; George McGarry, Airdrie, and Robert Gibson Roy, Larkhall, all of Scotland, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 487,336, July 10, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,893

Claims priority, application United Kingdom, July 11, 1973, 33149/73

Int. Cl.[2] C07J *71/00*

U.S. Cl. 260—239.55 D **6 Claims**

1. 11β-Hydroxy-16α, 17α-isopropylidenedioxy-21-methyl-$\Delta^{1,4}$-pregnadiene-3,20-dione.

4,031,076
METHAMPICILLIN LYSINATE AND ITS METHOD OF MANUFACTURING

Young Sul Kim, 302-62, Yichon-dong, Yong San-Ku, Seoul, South Korea

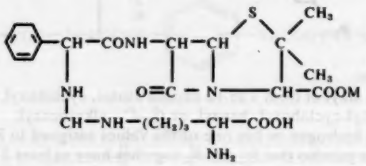
Filed July 29, 1976, Ser. No. 709,644

Claims priority, application South Korea, July 31, 1975, 1686

Int. Cl.[2] C07D *499/68*

U.S. Cl. 260—239.1 **1 Claim**

1. Methampicillin Lysinate having superior water solubility and the formula:



wherein M is selected from the group consisting of hydrogen, sodium, potassium, calcium and aluminum.

4,031,077
ANTIBACTERIAL 3-PHOSPHONO PENAMS

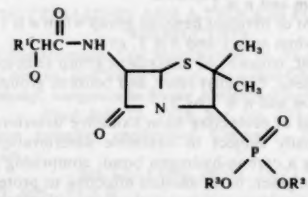
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 619,634, Oct. 6, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,423

Int. Cl.[2] C07D *499/32*

U.S. Cl. 260—239.1 **12 Claims**

1. A compound of the formula (I)



(I)

and the pharmaceutically acceptable salts thereof, wherein

$R^2$and $R^3$are the same or different and are selected from the group consisting of hydrogen and methyl;

R^1 is selected from the group consisting of phenyl, phenoxy, 1,4-cyclohexadienyl, thienyl and phenyl monosubstituted by a member of selected from the group consisting of hydroxy, and aminomethyl, and Q is selected from the group consisting of hydrogen, amino, carboxy and sulfo; provided that:

when R^1 is selected from the group consisting of phenoxy and phenyl monosubstituted by aminomethyl, Q is hydrogen;

when Q is carboxy, R^1 is selected from the group consisting of phenyl and thienyl;

and when Q is sulfo, R^1 is phenyl.

4,031,078
BENZODIAZEPINE DERIVATIVES

Andre Szente, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

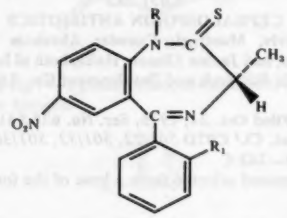
Filed Oct. 14, 1975, Ser. No. 622,291

Claims priority, application Switzerland, Oct. 21, 1974, 14049/74

Int. Cl.² C07D *243/22*

U.S. Cl. 260—239.3 D **4 Claims**

1. A compound of the formula



wherein R represents a hydrogen atom or a lower alkyl group and R_1 represents a hydrogen or halogen atom or a trifluoromethyl group,

which has the absolute configuration S at the carbon atom in the 3-position.

4,031,079
INTERMEDIATES FOR 2-AMINOBENZODIAZEPINE-5-ONES

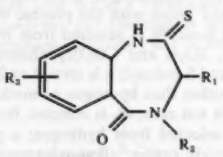
Richard J. Mohrbacher, Maple Glen, and Philip P. Grous, Philadelphia, both of Pa., assignors to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Division of Ser. No. 615,667, Sept. 22, 1975. This application June 23, 1976, Ser. No. 699,097

Int. Cl.² C07D *243/20, 243/22*

U.S. Cl. 260—239.3 D **2 Claims**

1. A compound having the formula:



wherein:

R_1 is a member selected from the group consisting of hydrogen and aryl, said aryl being a member selected from the group consisting of phenyl, trifluoromethylphenyl and phenyl substituted with from 1 to 3 members selected from the group consisting of halo, loweralkyl, hydroxy, and loweralkoxy;

R_2 is loweralkyl; and

R_3 is a member selected from the group consisting of hydrogen, halo, nitro, loweralkoxy and loweralkyl.

4,031,080
16-ALPHA-METHYL-17 ALPHA-BROMO-1,4-PREGNADIENE-21-OL-3,20-DIONE-DERIVATIVES

Gaetano Palladino, Milan, Italy, assignor to Lark S.p.A., Milan, Italy

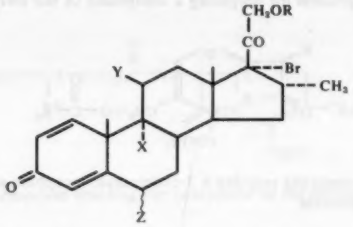
Filed Jan. 29, 1976, Ser. No. 653,612

Claims priority, application United Kingdom, Feb. 1, 1975, 4473/75

Int. Cl. C07j *17/00*

U.S. Cl. 260—239.55 R **11 Claims**

1. A 16alpha-methyl-17alpha-bromo-1,4-pregnadiene-21-ol-3,20 -dione-derivative of the structure :



wherein R is a member selected from the group consisting of hydrogen and an acyl radical, X is a member selected from the group consisting of hydrogen, bromine and fluorine atoms, Y is a member selected from the group consisting of hydrogen hydroxyl and oxygen, Z is a member selected from the group consisting of hydrogen, and alpha- or beta-oriented fluorine atoms.

4,031,081
BICYCLIC INTERMEDIATES FOR PREPARING 16-FLUORINATED PROSTAGLANDIN ANALOGS

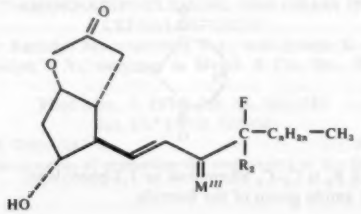
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 381,155, July 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 248,013, April 27, 1972, abandoned. This application Feb. 21, 1975, Ser. No. 551,826

Int. Cl.² G07D *307/93*

U.S. Cl. 260—240 R **15 Claims**

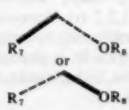
10. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof,

wherein C_nH_{2n} is alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive, in the chain between —CFR_2— and the terminal methyl;

wherein M''' is



wherein R_7 and R_8 are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; and wherein R_2 is hydrogen, methyl, ethyl, or fluoro.

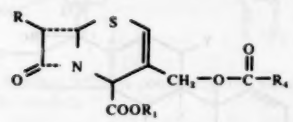
4,031,082

PROCESS FOR PREPARING 3-ACYCLOXYMETHYL-2-CEPHEM COMPOUNDS

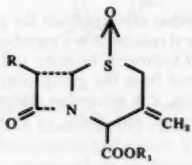
Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 19, 1976, Ser. No. 650,585
Int. Cl.² C07D *501/04*
U.S. Cl. 260—243 C **13 Claims**

1. A process for preparing a compound of the formula



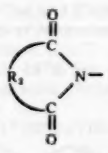
which comprises reacting a 3-exomethylenecepham sulfoxide of the formula



with a mixture of an acyl chloride of the formula

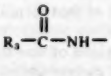
and the corresponding acid anhydride of said acyl chloride at a temperture of from about 70° C. to about 130° C., in which, in the above formulae, R_4 is C_1–C_4 alkyl, R_1 is a carboxylic acid protecting group, and R is

1. an imido group of the formula



in which R_2 is C_2–C_4 alkenylene or 1,2-phenylene;

2. an amido group of the formula



in which R_3 is

a. hydrogen, C_1–C_3 alkyl, halomethyl, benzyloxy, 4-nitrobenzyloxy, 2,2,2-trichloroethoxy, 4-methoxybenzyloxy, 3-(2-chlorophenyl)-5-methyl-isoxazol-4-yl;

b. the group R′ in which R′ is phenyl or phenyl substituted with 1 or 2 halogens, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl, or C_1–C_4 alkoxy;

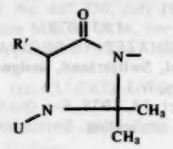
c. a group of the formula $R'—(O)_m—CH_2—$ in which R′ is as defined above and *m* is 0 or 1;

d. a group of the formula

in which R″ is R′ as defined above, 2-thienyl, or 3-thienyl, and R_1 is as defined above; or

e. a group of the formula R‴—CH_2— in which R‴ is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl, 1-tetrazolyl, or 4-isoxazolyl; or R is

3. an imidazolidinyl group of the formula



in which R′ is as defined above and U is nitroso or acetyl.

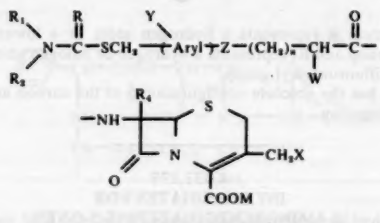
4,031,083

CEPHALOSPORIN ANTIBIOTICS

Fortuna Haviv, Montreal, Canada; Abraham Patchornik, Ness-Ziona, and Janina Altman, Haifa, both of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Oct. 24, 1975, Ser. No. 625,541
Int. Cl.² C07D *501/22, 501/32, 501/30*
U.S. Cl. 260—243 C **32 Claims**

1. A compound selected from a base of the formula:



wherein each of R_1 and R_2 is selected from hydrogen and lower alkyl of from 1 to 4 carbon atoms or NR_1R_2 taken together form a monocyclic heterocyclic group selected from pyrrolidino, piperidino and morpholino; R is oxygen or sulfur; Aryl is selected from phenyl and 2-thienyl; Y is selected from hydrogen, chlorine, bromine, a straight or branched lower alkyl group of from 1 to 4 carbon atoms and a lower alkoxy group of from 1 to 4 carbon atoms with the proviso that when Aryl is 2-thienyl, Y is hydrogen; Z is selected from a bond, oxygen, sulfur and imino with the proviso that when Aryl is 2-thienyl, Z is a bond; W is selected from hydrogen, methyl, amino, hydroxy, SO_3H and $COOR_3$ wherein R_3 is selected from hydrogen and 5-indanyl; n is zero, 1 or 2 with the proviso that when W is other than hydrogen or methyl and Z is other than a bond, n is not zero; R_4 is selected from hydrogen and methoxy; M is selected from hydrogen; a pharmaceutically acceptable nontoxic cation; alkanoyloxymethyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; alkanoylaminomethyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substituted with an alkyl group of from 1 to 4 carbon atoms; alkoxycarbonylaminomethyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substi-

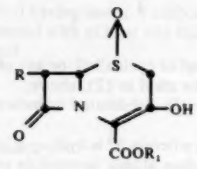
tuted with an alkyl group of from 1 to 4 carbon atoms; p-(alkanoyloxy)benzyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; and aminoalkanoyloxymethyl wherein the alkanoyl moiety contains from 2 to 15 carbon atoms and the amino nitrogen may be mono- or di-substituted with a lower alkyl group of from 1 to 4 carbon atoms; X is hydrogen or acetoxy; and pharmaceutically acceptable salts thereof.

4,031,084
PROCESS FOR CEPHALOSPORIN ANTIBIOTIC INTERMEDIATES

Stjepan Kukolja, and Douglas O. Spry, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

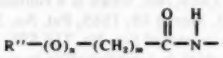
Filed Oct. 23, 1975, Ser. No. 625,281
Int. Cl.² C07D *501/04*
U.S. Cl. 260—243 C **10 Claims**

1. The process for preparing a 3-hydroxy-3-cephem sulfoxide ester of the formula

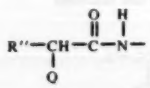


wherein R is H_3N^+—, phthalimido, succinimido, an acylamido group of the formula

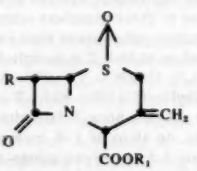
where R' is hydrogen, C_1 - C_6 alkyl, cyanomethyl, halomethyl; or an acylamino group of the formula



wherein R'' is phenyl or phenyl substituted by halogen, C_1–C_4 lower alkyl, C_1–C_4 lower alkoxy, nitro or carboxy, and *m* and *n* are independently 0 or 1; or R is substituted arylacylamido group of the formula



wherein R'' has the same meanings as defined above and Q is protected hydroxy, protected amino, carboxy, $-SO_2NH_2$ or the group $-SO_3H$; and R_1 is a carboxylic acid protecting group; which comprises (a) reacting in an inert solvent a 3-exomethylenecepham sulfoxide ester of the formula



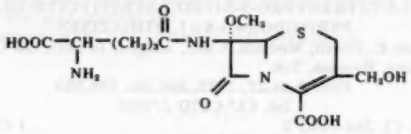
wherein R and R_1 have the same meanings as defined above, with at least two moles of ozone per mole of said 3-exomethylenecepham sulfoxide ester at a temperature between −90° and 20° C., and (b) decomposing the intermediate oxidation products.

4,031,085
PREPARATION OF 3-HYDROXYMETHYL-7β-AMINOADIPOYL-7α-METHOXY-3-CEPHEM-4-CARBOXYLIC ACID

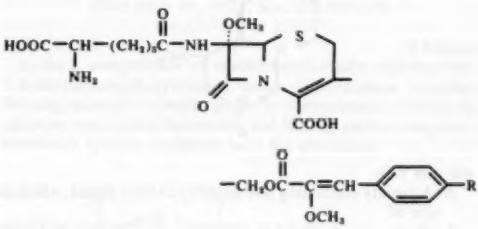
Seemon H. Pines, Murray Hill, and Matthew A. Kozlowski, South River, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 517,123, Oct. 23, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,325
Int. Cl.² C07D *501/02*
U.S. Cl. 260—243 C **2 Claims**

1. The process of preparing the compound



which comprises reacting the compound of the formula



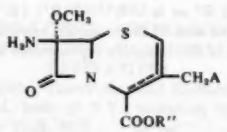
wherein R is hydroxy or sulfo-oxy in an aqueous system at between about pH 3.5–6.5 at 60°–70° C., and recovering the product thereby produced.

4,031,086
PROCESS FOR CLEAVAGE OF 7-AMINO-ADIPOYLAMINO SIDE CHAIN IN CEPHALOSPORINS

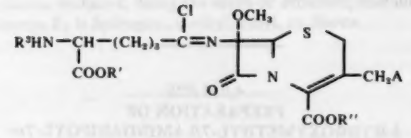
Sandor Karady, Mountainside, N.J., and Joseph S. Amato, Brooklyn, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 5, 1976, Ser. No. 664,341
Int. Cl.² C07D *501/04*
U.S. Cl. 260—243 C **4 Claims**

1. The process of preparing the compound of the formula:



wherein the dotted line represents that the unsaturation can be in the 2- or the 3-position, A is hydrogen or acetoxy, and R'' is methyl, benzyl or benzhydryl; which comprises reacting the compound



wherein R^3 is phthaloyl or mesyl, and R′ and A are as defined; in approximately equimolar amount with

LI[MeCuBuO]

at a temperature between about −100° C. to about 0° C.; followed by quenching in pH 7–8 buffer solution and recovering the desired product.

4,031,087

3,4,7,8-TETRAHYDRO-9-NITRO-7-SUBSTITUTED-2H,6H-PYRIMIDO-(4,3-B)(1,3)THIAZINES

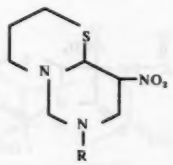
James E. Powell, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed June 27, 1975, Ser. No. 590,983

Int. Cl.² C07D *279/08*

U.S. Cl. 260—243 R **1 Claim**

1. A compound of the formula



wherein R is

A. A moiety containing one to thirty carbon atoms, which is one of

1. alkyl;

2. alkyl substituted by one or more of

a. halogen;

b. cyano;

c. cycloalkyl or alkylcycloalkyl in which the ring contains three to twelve carbon atoms;

d. furanyl, tetrahydrofuranyl, dioxolanyl, thienyl, thiopyranyl, pyridinyl, pyrrolidinyl and morpholino;

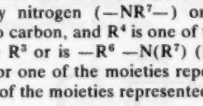
e. phenyl, optionally substituted on the ring by one of bromine, chlorine or iodine, nitro, cyano lower alkyl, lower alkoxy, lower alkylthio, amino (—N(R^3) (R^3)) or phenoxy, R^3 being hydrogen, alkyl, hydroxyalkyl, or phenyl or phenalkyl optionally substituted as indicated above;

f. hydroxyl, carboxy or alkoxycarbony;

g. R^3 —O—, R^3—S—, R^3—S(O)—, R^3 —$S(O)_2$—, R^3—C(O)—or R^3—O—C(O)—;

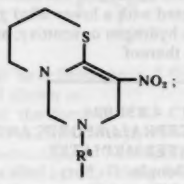
h. —N(R^3) (R^4) or —R^5—N(R^3) (R^4) wherein R^5 is alkylene in which one or more carbon atoms has been replaced by nitrogen (—NR^7—) or oxygen (—O—) bonded to carbon, and R^4 is one of the moieties represented by R^3 or is —R^6 —N(R^7) (R^7), wherein R^6 is alkylene or one of the moieties repesented by R^5, and R^7 is one of the moieties represented by R^3 or R^4 or R^7 is:

(a)

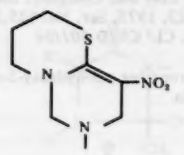


wherein R^8 is hydrogen, alkyl, alkenyl, alkythioalkyl, alkoxyalkyl, cycloalkylalkyl, cyanoalkyl, haloalkyl, haloalkenyl, or phenalkyl, as these moieties are described above or is:

(b)



(3)



4. alkenyl, alkynyl or cycloalkyl, or any of these substituted as indicated for alkyl in (2), above;

5. phenyl, optionally substituted as indicated above;

or is

B. —N(R^9) (R^8) wherein R^8 is hydrogen alkyl or alkanoyl of one to ten carbon atoms; benzoyl or phenyl and salts of such compound.

4,031,088

IODINATED ANILIC ACIDS

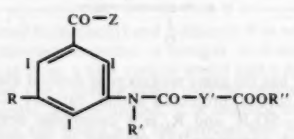
James H. Ackerman, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 323,710, Jan. 15, 1973, abandoned, which is a division of Ser. No. 109,631, Jan. 25, 1971, Pat. No. 3,770,820, which is a division of Ser. No. 25,262, April 2, 1970, Pat. No. 3,666,760, which is a continuation-in-part of Ser. No. 808,653, March 19, 1969, Pat. No. 3,609,147, which is a continuation-in-part of Ser. No. 715,558, March 25, 1968, abandoned, which is a continuation-in-part of Ser. No. 550,614, May 17, 1966, abandoned, said Ser. No. 808,653, is a continuation-in-part of Ser. No. 715,583, March 25, 1968, abandoned. This application June 10, 1974, Ser. No. 478,052

Int. Cl.² C07D *295/00*

U.S. Cl. 260—247.2 A **5 Claims**

1. A compound of the formula



wherein Y′ is a single bond, vinylene, or an alkylene bridge having from one to eight carbon atoms or such a group interrupted by from one to three members selected from O, S, SO and SO_2, said members, when more than one, being separated by at least two carbon atoms; Z is morpholino, pyrrolidino or piperidino; R is H_2N, HOOC—Y′—CO—NH, HOOC—Y′—CO—N(lower alkyl), T—CO—NH, T—CO—$NHCH_2$, or (T—CO)N(lower alkyl, where T is hydrogen, cycloalkyl of 3–6 ring members, or alkyl of 1–8 carbon atoms optionally interrupted by from 1 to 4 oxygen atoms, each oxygen, when more than one, being separated by at least two carbon atoms; R′ is hydrogen, lower-alkyl, hydroxy-lower-alkyl, lower-alkoxylower-alkyl, or lower-alkoxy-lower-alkoxy-lower-alkyl; and R″ is hydrogen or lower-alkyl.

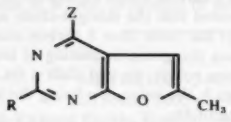
4,031,089

FURO (2,3d) PYRIMIDINES

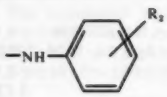
Claude P. Fauran, Paris; Guy R. Bourgery, Colombes; Guy M. Raynaud, and Nicole A. M. Dorme, both of Paris, all of France, assignors to Delalande S.A., Courbevoie, France

Division of Ser. No. 506,826, Sept. 17, 1974, Pat. No. 4,007,187. This application Aug. 18, 1976, Ser. No. 715,377
Claims priority, application France, Oct. 2, 1973, 73.35190; May 20, 1974, 74.17484
Int. Cl.² C07D *491/04*
U.S. Cl. 260—247.5 DP 3 Claims

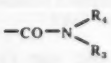
1. A compound having the formula



in which R is alkyl having one to 4 carbon atoms, phenyl, or phenyl substituted with at least one halogen or by a trifluoromethyl, and
Z is



in which R_2 is



wherein

is morpholino, pyrrolidino, piperidino or hexamethyleneimino.

4,031,090

STABILIZED ISOCYANURATE

David Goldstein, East Brunswick; William Henry Kibbel, Jr., Pennington, and Roger C. Hollenbach, Kendall Park, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jan. 23, 1976, Ser. No. 651,942
Int. Cl.² C07D *251/36*, *251/32*
U.S. Cl. 260—248 C 2 Claims

1. In the process of preparing a stabilized composition of matter containing as its essential components 10–70% of an alkali metal dichloroisocyanurate, 25–75% of cyanuric acid or the alkali metal salts thereof, and 5–50% of an inorganic salt, the pH of which is at least 9 and preferably 9–13 in aqueous media, the improvement of increasing the dissolution rate of said composition comprising (a) combining the ingredients in powder form to produce a homogeneous mixture; (b) compacting the homogeneous mixture under pressure and (c) crushing and screening the compacted materials of step (b) to provide a −10+70 mesh granular material.

4,031,091

PROCESS FOR PURIFYING CRUDE CYANURIC ACID

Sidney Berkowitz, Highland Park, and John D'Angelo, Old Bridge, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 447,824, March 24, 1974. This application Dec. 29, 1975, Ser. No. 644,573
Int. Cl.² C07D *251/32*
U.S. Cl. 260—248 A 1 Claim

1. A novel free-flowing cyanuric acid composition having at least 90% cyanuric acid crystals with particle sizes between 400 and 650 microns and containing about 0.01 to about 0.08% phosphate values produced by mixing sufficient amounts of crude cyanuric acid with an aqueous phosphoric acid solution containing about 10 to about 30% phosphoric acid to form a 10 to 45% crude cyanuric acid slurry;
heating the slurry to a temperature of about 180° to about 220° C under at least the autogenously developed pressure to digest the crude cyanuric acid;
cooling the digested cyanuric acid to precipitate the cyanuric acid crystals; and
recovering the novel cyanuric acid composition.

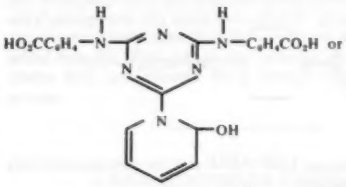
4,031,092

1,3-BIS-(CARBOXY-PHENYLAMINO)-s-TRIAZINES

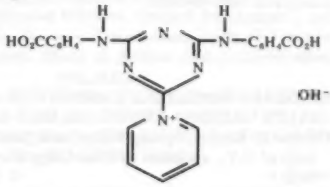
Elwood L. Strebel, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 16, 1975, Ser. No. 587,240
Int. Cl.² C07D *251/70*
U.S. Cl. 260—249.6 2 Claims

1. As a composition of matter substantially chlorine free 1,3-bis(carboxyphenylamino)triazine 5-pyridinium complex forming lyotropic nematic phase in concentrated solution in aqueous ammonium hydroxide and having nuclear magnetic resonance spectra consistent with the structures:



or



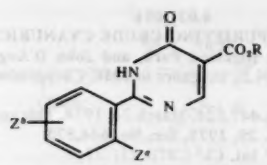
4,031,093

1,6-DIHYDRO-6-OXO-2-(ORTHO-SUBSTITUTED PHENYL)PYRIMIDINE-5-CARBOXYLIC ACID DERIVATIVES

Peter Frederick Juby, Jamesville, and Richard Anthony Partyka, Liverpool, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

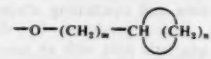
Continuation-in-part of Ser. No. 611,765, Sept. 9, 1975, abandoned. This application Apr. 23, 1976, Ser. No. 679,630
Int. Cl.² C07D *239/22*
U.S. Cl. 260—251 R 62 Claims

1. A compound of the formula



Ia

wherein Z^a is —O—C_1—C_6 alkyl, —O—C_2—C_6 alkenyl or



in which m is 0 or an integer from 1 to 6 and n is an integer from 2 to 7, Z^b has the meaning stated above for Z^a and in addition may be hydrogen, halogen, amino, C_1-C_6 alkylamino, di(C_1-C_6)alkylamino, or carb(C_1–C_6)alkoxy, and R is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, pivaloyloxymethyl, acetoxymethyl and methoxymethyl, or a pharmaceutically acceptable salt thereof, provided that when Z^a is methoxy, Z^b is not hydrogen.

4,031,094

N-META-TRIFLUOROMETHYLPIPERAZINES

Don Pierre Rene Lucien Giudicelli, Fontenay-sous-Bois, and Henry Najer, Paris, both of France, assignors to Synthelabo, Paris Cedex, France

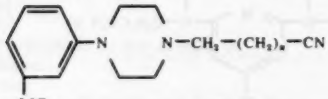
Division of Ser. No. 402,783, Oct. 2, 1973, Pat. No. 3,954,763, which is a continuation-in-part of Ser. No. 349,869, April 10, 1973, abandoned. This application Jan. 22, 1976, Ser. No. 651,274

Claims priority, application France, Apr. 10, 1972 72.12442

Int. Cl.² C07D *295/14*

U.S. Cl. 260—268 PH **2 Claims**

1. A compound of the formula:



wherein n is an integer from 1 to 6 and the pharmaceutically acceptable salts thereof.

4,031,095

HINDERED PIPERIDINE CARBOXYLIC ACIDS, METALS SALTS THEREOF AND STABILIZED COMPOSITIONS

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

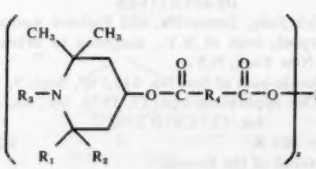
Filed June 30, 1975, Ser. No. 592,006

The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.

Int. Cl.² C07D *211/46*

U.S. Cl. 260—270 C **14 Claims**

1. A compound of the formula



wherein

R_1 and R_2 independently of each other are straight- or branched-chain alkyl having from 1 to 6 carbon atoms, or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is substituted or substituted with a methyl group,

R_3 is hydrogen, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 to 4 carbon atoms, propargyl, benzyl, or alkyl substituted benzyl,

R_4 is straight-chain alkenylene of 2 to 4 carbon atoms, 1,2-cycloalkylene or cycloalkenylene having 4 to 6 carbon atoms, 2,3-bicycloalkylene or bicycloalkenylene having 7 to 8 carbon atoms or 1,2-, 1,3- or 1,4-phenylene, or a straight-chain alkylene of 1 to 4 carbon atoms substituted by alkyl of 1 to 18 carbon atoms or alkenyl of 2 to 18 carbon atoms, provided that the straight-chain alkylene substituted by alkyl has more than 8 carbon atoms,

M is a metal selected from the group consisting of nickel, manganese, copper, zinc, cobalt, tin and dialkyl tin, and

z has a value of from 1 to 4, the value of z being the same as the available valence of M.

4,031,096

FLUORESCENT AZABENZANTHRONIC DYES

Giampiero Pieri, Saronno (Varese); Filippo Maria Carlini, Novara; Camillo Paffoni, Pogno (Novara), and Gioacchino Boffa, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

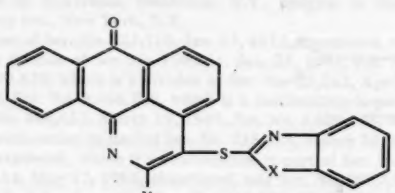
Filed Apr. 21, 1976, Ser. No. 679,030

Claims priority, application Italy, Apr. 24, 1975, 22723/75

Int. Cl.² C09B *5/14*

U.S. Cl. 260—272 **3 Claims**

1. A fluorescent azabenzanthronic dye having the general formula (I):



(I)

wherein X = —NH— or —S—; and Y = —OCH_3 or —OC_2H_5.

4,031,097

DESCARBOXYLYSERGIC ACID

Nicholas J. Bach; David A. Hall, and Edmund C. Kornfeld, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 504,395, Sept. 9, 1974, Pat. No. 3,954,772, which is a continuation-in-part of Ser. No. 389,281, Aug. 17, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,306

Int. Cl.² C07D *457/00*

U.S. Cl. 260—285.5 **3 Claims**

1. Descarboxylysergic acid.

4,031,098

CAMPTOTHECIN ANALOGUES

Tsutomu Sugasawa, Kobe, Japan, assignor to Shionogi & Co., Ltd., Japan

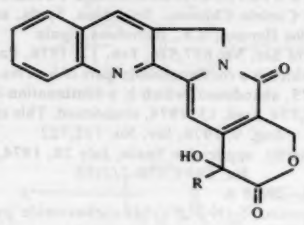
Filed Jan. 5, 1976, Ser. No. 646,596

Claims priority, application Japan, Feb. 20, 1975, 50-21359

Int. Cl.² C07D *491/22*

U.S. Cl. 260—287 C **4 Claims**

1. A compound of the formula:



wherein R is allyl, propargyl or benzyl.

4,031,099

4-HYDROXY-3-NITRO-5,6,7,8 TETRAHYDRO-CARBOSTYRILS

Derek Richard Buckle, Redhill; Barrie Christian Charles Cantello, Horsham, and Harry Smith, Maplehurst, all of England, assignors to Beecham Group Limited, England

Filed Oct. 7, 1974, Ser. No. 512,949

Claims priority, application United Kingdom, Oct. 11, 1973, 47508/73

Int. Cl.² C01D *215/18*; A61K *31/47*

U.S. Cl. 260—289 K **5 Claims**

1. The compound which is 4-hydroxy-7-methyl-3-nitro-5,6,7,8-tetrahydrocarbostyril.

5. The compound which is 6,7-dimethyl-4-hydroxy-3-nitro-5,6,7,8-tetrahydrocarbostyril.

4,031,100

PROCESS FOR MAKING 2,6-DIFLUOROPYRIDINE

Thomas J. Giacobbe, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 23, 1976, Ser. No. 716,863

Int. Cl.² C07D *213/81*

U.S. Cl. 260—290 HL **17 Claims**

1. The improvement in the process of preparing 2,6-difluoropyridine by reacting KF with an alpha-chloropyridine which is 2,6-dichloro- or 2-chloro-6-fluoropyridine, at an elevated temperature in an aprotic, polar solvent, whereby practical rates of conversion are attained without resort to temperatures in excess of about 185°,

said improvement comprising:

a. providing a mixture of solid KF particles and a solution in dimethyl sulfoxide of

1. said alpha-chloropyridine reactant, and

2. a catalytically effective amount of a catalyst which is $(CH_3)_4N^+Cl^-$, $(CH_3)_4P^+Cl^-$ or both;

said mixture containing less than 0.1 gram of acids, bases or organic hydroxy compounds and less than about 1 gram of water, per 100 grams of dimethyl sulfoxide; and

b. intensely stirring said mixture and maintaining the temperature thereof within the range of from about 100° to about 185°,

the reaction being carried out under an inert atmosphere if a reaction temperature above about 180° is employed.

4,031,101

CIS-2, 6-DIMETHYL-α,α-DIPHENYL-1-PIPERIDINEBUTANOL COMPOUNDS

Robert Willerton Fleming, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Apr. 15, 1976, Ser. No. 677,094

Int. Cl.² C07D *211/32*

U.S. Cl. 260—293.84 **3 Claims**

1. cis-2,6-Dimethyl-α,α-diphenyl-1-piperidinebutanol and acid-addition salts thereof.

4,031,102

CYCLOPENTENO[b]PYRIDINE DERIVATIVES

Adrian Charles Ward Curran, South Cave; Roger Crossley, Reading, and David George Hill, Cookham, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

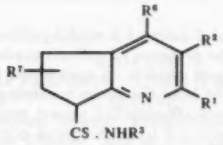
Continuation-in-part of Ser. No. 600,257, July 30, 1975, which is a continuation-in-part of Ser. No. 460,265, April 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,289, Oct. 3, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 624,080

Claims priority, application United Kingdom, Oct. 21, 1972, 48595/72; Oct. 15, 1973, 7424/73; July 21, 1973, 34866/73; Aug. 16, 1973, 38701/73

Int. Cl.² C07D *221/16*

U.S. Cl. 260—294.8 C **7 Claims**

1. A compound of formula



or in acid addition salt thereof with a pharmaceutically acceptable acid, wherein R^1, R^2 and R^6 are the same or different and are selected from hydrogen and alkyl containing from 1 to 6 carbon atoms, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, R^7 represents hydrogen or 1 or 2 groups selected from alkyl of 1 to 6 carbon atoms (which may be substituted by alkoxy of 1 to 6 carbon atoms or trifluoromethyl), phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms or phenyl, and the phenyl or the phenyl portion of the phenylalkyl group of R^7 may be substituted by alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, halogen, nitro or trifluoromethyl, with the provisos that (1) when R^1 and R^2 or R^2 and R^6 are both alkyl they are selected from normal and secondary alkyl groups and (2) when two alkyl R^7 groups are present on the same carbon atom then they are both n-alkyl groups and when two R^7 alkyl groups are present on adjacent carbon atoms they are selected from normal and secondary alkyl groups.

4,031,103

1,8-NAPHTHYRIDINE COMPOUNDS

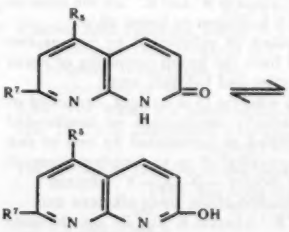
Hayden Windsor Richard Williams, Dollard des Ormeaux, and Clarence Stanley Rooney, Beaconsfield, both of Canada, assignors to Merck Sharp & Dohme (I.A.) Corporation, Rahway, N.J.

Division of Ser. No. 477,392, June 7, 1974, Pat. No. 3,962,262, which is a division of Ser. No. 350,285, April 11, 1973, Pat. No. 3,843,663. This application Dec. 9, 1975, Ser. No. 639,036

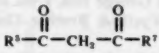
Int. Cl.² C07D *213/44*

U.S. Cl. 260—295 N **3 Claims**

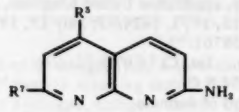
1. A process for the preparation of a 1,8-naphthyridine compound having the structures



which comprises admixing equimolar quantities of 2,6-diaminopyridine and a β-diketone of the structure



warming the admixture to its boiling point to initiate reaction providing a 2-amino-1,8-naphthyridine compound having the structure



I

and, reacting said 2-amino-1,8-naphthyridine with an alkali metal nitrite in the presence of trifluoroacetic acid or pentafluoropropionic acid wherein, in each of the foregoing structures R^5 is selected from the group consisting of lower alkyl, trifluoromethyl, pentafluoroethyl, phenyl, pyridyl, thienyl and naphthyl; R^7 is selected from the group consisting of lower alkyl, trifluoromethyl and pentafluoroethyl, and at least one of R^5 or R^7 is trifluoromethyl or pentafluoroethyl.

4,031,104

1,4-DIHYDROPYRIDINE CARBOXYLIC ACID ESTERS

Friedrich Bossert; Horst Meyer, both of Wuppertal, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

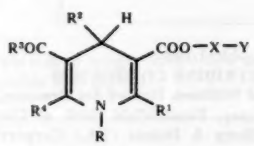
Division of Ser. No. 548,394, Feb. 10, 1975, Pat. No. 3,996,234, which is a division of Ser. No. 350,381, April 12, 1973, Pat. No. 3,905,970. This application Nov. 12, 1975, Ser. No. 631,119

Claims priority, application Germany, Apr. 18, 1972, 2218644

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **8 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen, straight- or branched-chain lower alkyl, alkenyl of 2 to 4 carbon atoms or alkynyl of 2 to 4 carbon atoms;

R^1 and R^4 are the same or different and are each hydrogen or straight or branched-chain lower alkyl;

X is straight- or branched-chain lower alkylene;

Y is the moiety NR'R'' wherein R' and R'' are the same or different and are each hydrogen or lower alkyl;

R^2 is pyridyl unsubstituted or substituted by one or two substituents selected from the group consisting of lower alkyl, lower alkoxy, nitro and halogen; and

R^3 is the moiety —OQ wherein Q is straight, branched or cyclic, saturated, partially unsaturated or unsaturated lower alkyl unsubstituted or substituted by one or two hydroxyl groups, alkoxyalkyl of up to 6 carbon atoms in both moieties or the moiety —O—X'—Y' wherein

X' is straight- or branched-chain lower alkylene and

Y' is the moiety NR'R'' wherein R' and R'' are the same or different and are each hydrogen or lower alkyl.

4,031,105

3-(N-2', 6'XYLYL)-CARBOXAMIDE PYRIDONE-2

Jose-Alfonso Canicio Chimeno, Barcelona, Spain, assignor to Laboratorios Hermes, S.A., Barcelona, Spain

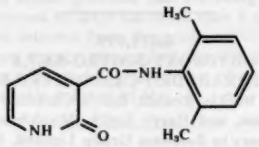
Division of Ser. No. 657,576, Feb. 12, 1976, Pat. No. 3,984,423, which is a continuation-in-part of Ser. No. 565,280, April 4, 1975, abandoned, which is a continuation-in-part of Ser. No. 505,774, Sept. 13, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,722

Claims priority, application Spain, July 20, 1974, 428449

Int. Cl.² C07D *213/56*

U.S. Cl. 260—295.5 A **1 Claim**

1. A compound, 3-(N-2',6'xylyl)-carboxamide pyridone-2, formula (I)



and its tautomeric chemical entities.

4,031,106

SYNTHESIS OF AROMATIC AMINES BY REACTION OF AROMATIC COMPOUNDS WITH AMMONIA

Thomas Wayne DelPesco, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 429,028, Dec. 19, 1973, abandoned. This application Oct. 16, 1975, Ser. No. 622,890

Int. Cl.² C07D *213/73*

U.S. Cl. 260—296 R **8 Claims**

1. In a process of the present invention an aromatic compound selected from anthracene; phenanthrene; quinoline; isoquinoline and compounds having the formula $(X)_m$ $(Y)_n$ wherein X is benzene or pyridine, *m* is 1 or 2, *n* is 0, 1 or 2, and Y is alkyl having one to six carbon atoms, halogen, nitrile, hydroxy, $CONH_2$, alkoxy having one to six carbon atoms, aryloxy, amino and aralkyl, with the proviso that when Y is aryloxy, a secondary or tertiary arylamine or an aralkyl, *n* is 1 and when *n* is 2, the substituents Y may be the same or different, is aminated by reacting ammonia with said aromatic compound at a temperature of from about 150° C. to about 500° C. and at a pressure of from about 10 to 1000 atmospheres, in the presence of a conditioned $Ni/NiO/ZrO_2$ cataloreactant with a mole ratio of nickel to nickel oxide of 0.001 to 10, the improvement which comprises carrying out the reaction in intimate molecular contact with said conditioned cataloreactant containing a molar ratio of 0.0001 to 0.05 of a dopant to total nickel, wherein said dopant is selected from an oxide of lanthanum, samarium, holmium, europium, erbium, praseodymium, neodymium, tertium, ytterbium, dysprosium, yttrium and mixtures thereof.

4,031,107*

METHOD FOR INTRODUCING AMINO GROUPS INTO BENZIMIDAZOLE OR IMIDAZOPYRIDINE COMPOUNDS

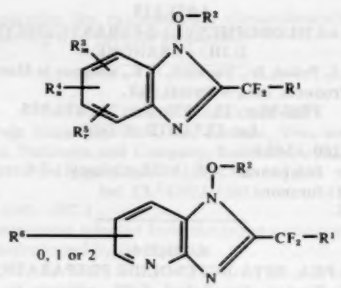
George O. P. O'Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 535,233, Dec. 23, 1974, abandoned, which is a division of Ser. No. 314,882, Dec. 13, 1972, Pat. No. 3,875,173, which is a continuation-in-part of Ser. No. 102,266, Dec. 28, 1970, abandoned. This application Feb. 23, 1976, Ser. No. 660,210

Int. Cl.² C07D *235/14*, *471/04*

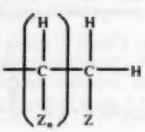
U.S. Cl. 260—296 H **12 Claims**

1. A process suitable for introducing an amino group into the benzene or pyridine ring of a benzimidazole or imidazopyridine compound, which comprises reacting a first compound of one of the formulae



wherein

R^1 represents hydrogen, chloro, fluoro, perfluoroalkyl of C_1–D_6, or radical of the formula



where each Z represents hydrogen or halo and n represents O or 1;

R^2 represents

1. alkyl of C_1–C_6;
2. alkenyl of C_2–C_6;
3. cycloalkyl of C_5–C_6;
4. benzyl;
5. phenethyl; or
6. tetrahydro-2-pyranyl;

each R^3 independently represents halo;

each R^4 independently represents nitro, $-CF_3$, $-CF_2Cl$, or $-CF_2H$;

R^5 represents cyano or loweralkylsulfonyl of C_1–D_4;

m represents an integer of from 0 to 3, both inclusive;

n represents an integer of from 0 to 2, both inclusive;

r represents 0 or 1;

and the sum of *m*, *n*, and *r* is an integer of from 0 to 3 , both inclusive, and

each R^6 represents halogen, nitro, $-CF_3$, $-CF_2Cl$, $-CF_2H$, or loweralkylsulfonyl of C_1–C4, subject to the limitation that not more than one R^6 represents nitro, $-CF_3$, $-CF_2Cl$, $-CF_2H$, or loweralkylsulfonyl as defined; with a nucleophilic reagent selected from the group consisting of ammonia, and primary and secondary amines having a K_b from $10^{-3}$to 10^{-11}.

4,031,108

2-HYDROXYMETHYL-3-BENZYLOXYPYRIDINE-6-EPOXYETHANE

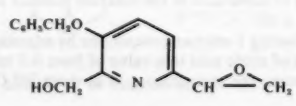
Susumu Nakanishi, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 615,463, Sept. 22, 1975, which is a division of Ser. No. 513,213, Oct. 9, 1974, Pat. No. 3,948,919, which is a continuation-in-part of Ser. No. 428,451, Dec. 26, 1973, abandoned. This application July 14, 1976, Ser. No. 705,039

Int. Cl.² C07D *405/04*

U.S. Cl. 260—297 R **1 Claim**

1. A compound of the formula



4,031,109

METHOD FOR THE PREPARATION OF X-FORM METAL PHTHALOCYANINE AND X-FORM METAL FREE COMPOUNDS

Clifford H. Griffiths, Brighton, and Richard C. Keezer, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 756,363, Aug. 30, 1968, abandoned. This application Nov. 22, 1972, Ser. No. 308,915

Int. Cl.² C09B *47/04*

U.S. Cl. 260—314.5 **11 Claims**

1. A method of preparing X-form metal phthalocyanine which comprises heating a metal phthalocyanine polymorph to from about 600° to about 650° C and allowing said polymorph to cool.

4,031,110

METHOD OF PREPARING 3,3-BIS (CHLOROMETHYL) OXETANE

Richard Frederick Stockel, Bridgewater, and Peter Carl Valenti, East Windsor, both of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Filed July 13, 1976, Ser. No. 704,887

Int. Cl.² C07D *305/06*

U.S. Cl. 260—333 **14 Claims**

1. A process for making 3,3-bis(chloromethyl) oxetane which comprises:

a. reacting N,N-dialkyl formamide, wherein the alkyl group contains from 1 to 4 carbon atoms, with a chlorinating agent selected from the group consisting of $SOCl_2$, $POCl_3$, and $COCl_2$, at a temperature of from about 15° to about 125° C.,

b. reacting the product obtained from step (a) with pentaerythritol at a temperature of from about 15° C. to about 125° C. to make pentaerythritol monochlorohydrin,

c. reacting said pentaerythritol monochlorohydrin with $SOCl_2$ to form pentaerythritol trichlorohydrin under conditions which substantially minimize the formation of pentaerythritol monochlorohydrin and pentaerythritol dichlorohydrin,

d. reacting said pentaerythritol trichlorohydrin with a metal hydroxide selected from the group consisting of alkali metal hydroxides and alkaline earth metal hydroxides at a temperature in the range of from about 50° C. to the reflux temperature of the reaction mixture, to produce 3,3-bis(chloromethyl)oxetane, and

e. removing said 3,3-bis(chloromethyl)oxetane from the reaction mixture.

4,031,111

MACROCYCLIC HETERO IMINE COMPLEXING AGENTS

Charles John Pedersen, Salem, N.J., and Marilyn H. Bromels, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

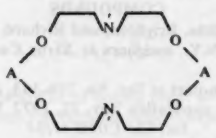
Continuation of Ser. No. 321,575, Jan. 8, 1973, Pat. No. 3,847,949, which is a continuation-in-part of Ser. No. 36,689, May 12, 1970, abandoned. This application Sept. 6, 1974, Ser. No. 503,777

The portion of the term of this patent subsequent to Nov. 12, 1991, has been disclaimed.

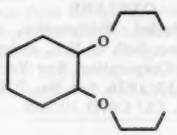
Int. Cl.² C07D *273/00, 498/08*

U.S. Cl. 260—340.3 **2 Claims**

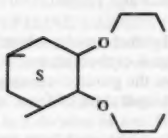
1. A macrocyclic compound of the formula



where A is a carbocyclic ring which is vicinally fused to the macrocyclic ring and is selected from the group consisting of (a) phenylene, naphthalene, phenanthralene, and anthralene, (b) the saturated analogs of (a), and the halo, nitro, nitroso, $-NH_2$, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_6–C_{12} aryl, C_7–C_{16} aralkyl, C_1–C_4 alkoxy, cyano, hydroxy, carboxy or sulfo derivatives thereof, and the third valence of the nitrogen atoms is occupied with a member of selected from the group consisting of hydrogen,



and



4,031,112

CYCLIC ACETALS

Knut Oppenlaender, Ludwigshafen; Guenter Uhl, Worms; Herbert Helfert, Frankenthal; Hans-Georg Scharpenberg, Limburgerhof, and Karl Stork, Lampertheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

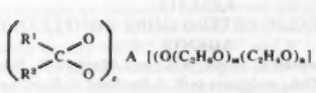
Filed Feb. 17, 1976, Ser. No. 658,524

Claims priority, application Germany, Mar. 12, 1975, 2510636

Int. Cl.² C07D 319/04

U.S. Cl. 260—340.7 **3 Claims**

1. Cyclic acetals or ketals of the formula I



I

where R^1 is alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 20 carbon atoms phenyl, p-nitrophenyl, hydroxyphenyl, p-dimethylaminophenyl, o-, m-, or p-chlorophenyl o-bromophenyl, R^2 is hydrogen or has one of the meanings defined for R^1, said meaning being identical to or different from R^1, or R^1 and R^2 together are an aliphatic five-membered or six-membered ring, A is a radical, free from hydroxyl groups, of a polyalcohol with $2z + y$ OH groups and of 3 to 6 carbon atoms, z is 1 or 2, y is 1 or 2, m is from 5 to 20 and n is from 10 to 100.

4,031,113

5-[5-(4-CHLOROPHENYL)-2-FURANYL]DIHYDRO-2(3H)-FURANONE

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,095

Int. Cl.² C07D 407/04

U.S. Cl. 260—343.6 **1 Claim**

1. The compound 5-[5-(4-chlorophenyl)-2-furanyl]dihydro-2(3H)-furanone.

4,031,114

ALPHA, BETA-BUTENOLIDE PREPARATION

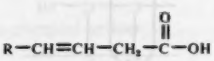
Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1976, Ser. No. 671,881

Int. Cl.² C07D 307/32

U.S. Cl. 260—343.6 **8 Claims**

1. A method for preparing an alpha,beta-dehydro-gamma-butyrolactone which comprises contacting a carboxylic acid of the formula



wherein R is H or C_1 to C_{10} alkyl group, with oxygen and a catalyst comprising a noble metal halide, a copper or iron halide and an alkali metal halide at a temperature between 50° and 300° C and superatmospheric pressure.

4,031,115

4-PENTENOIC ACID CONVERSION

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 29, 1976, Ser. No. 671,880

Int. Cl.² C07D 307/32

U.S. Cl. 260—343.6 **7 Claims**

1. A method for preparing a gamma-chloromethyl-gamma-butyrolactone which comprises contacting 4-pentenoic acid with oxygen and a catalyst comprising a noble metal chloride, a copper or iron chloride and an alkali metal chloride at a temperature between 50° and 200° C and superatmospheric pressure.

4,031,116

PROCESS FOR PREPARING PURE 1-NITROANTHRAQUINONE

Karl-Werner Thiem, Cologne; Wolfgang Auge, Odenthal, and Rütger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 499,734, Aug. 22, 1974, abandoned. This application July 20, 1976, Ser. No. 707,130

Claims priority, application Germany, Aug. 31, 1973, 2343978

Int. Cl.² C07C 76/00

U.S. Cl. 260—369 **19 Claims**

1. Process for preparing 1-nitroanthraquinone substantially free from dinitroanthraquinone, which comprises:

i. nitrating anthraquinone or a mixture which contains anthraquinone with at least 90% nitric acid at a temperature of at least 0° C wherein the mole ratio of nitric acid to anthraquinone is less than 20 to 1;

ii. stopping the reaction when the anthraquinone conversion is at least 50% by cooling the reaction mixture to a temperature of at most 30° C and/or by adjusting the mole fraction of nitric acid in the reaction mixture to a value of at most 0.86;

iii. precipitating 1-nitroanthraquinone by adjusting the mole fraction of nitric acid to a value of from 0.7 to 0.4 and/or by reducing the temperature to at most 20° C; and

iv. separating the precipitated 1-nitroanthraquinone and subjecting it to vacuum distillation.

4,031,117

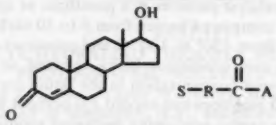
TESTOSTERONE DERIVATIVES

Pemmaraju Narasimha Rao, San Antonio, Tex., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Sept. 22, 1975, Ser. No. 615,812
Int. Cl.² C07J 1/00
U.S. Cl. 260—397.1 **21 Claims**

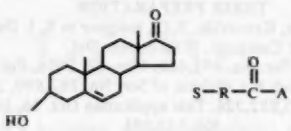
1. A compound selected from the group consisting of compounds represented by the formula:

(a)



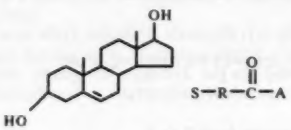
wherein R is an alkyl group of from 1 to 6 carbon atoms A is selected from the group consisting of —OH, —OM wherein M is an alkali metal barium, calcium, or strontium, and OY wherein Y is an alkyl group of from 1 to 6 carbon atoms.

(b)



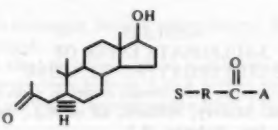
wherein R and A are as defined above and

(c)



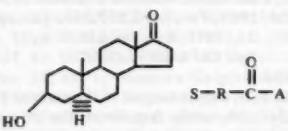
wherein R and A are as defined above.

(d)



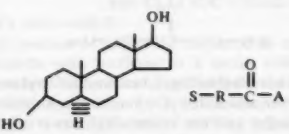
wherein R and A are as defined above

(e)



wherein R and A are as defined above, and

(f)



wherein R and A are as defined above.

4,031,118

ESTER-CONTAINING PROCESS AND COMPOSITIONS

Clark Ober Miller, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 398,034, Sept. 17, 1973, Pat. No. 3,957,854, which is a continuation-in-part of Ser. No. 152,425, June 11, 1971, abandoned, which is a division of Ser. No. 12,838, Feb. 19, 1970, abandoned, and a continuation-in-part of Ser. No. 823,990, May 12, 1969, abandoned. This application Dec. 29, 1975, Ser. No. 644,677
Int. Cl.² C07C 103/14
U.S. Cl. 260—404.5 **28 Claims**

1. Oil-soluble carboxylic acid esters prepared by the esterification of

A. at least one carboxylic acid acylating agent having an average of at least fifty aliphatic carbon atoms per molecule exclusive of the carboxylic carbon atom; with

B. at least one polyoxyalkylene alcohol which is a demulsifier for aqueous emulsions, has an average molecular weight in the range of from about 1,000 to about 10,000, and is a block polymer comprising (1) a hydrophobic portion corresponding to the formula, —CH(R′)—CH₂—O—, wherein R′ is an alkyl group of up to three carbon atoms, and (2) from about 5% to about 40% by weight of a hydrophilic portion corresponding to the formula —CH₂—CH₂—O—; wherein the total amount of (A) and (B) used in the esterification is such that there is at least 0.001 equivalent of (B) for each equivalent of (A).

4,031,119

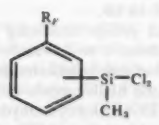
[PERFLUOROALKYL(ALKOXY)PHENYL]METHYLDICHLOROSILANES AND METHOD OF PREPARING SAME

Alexei Ivanovich Ponomarev, prospekt Stachek, 59, korpus 2, kv. 47; Sergei Vasilievich Sokolov, ulitsa III Internatsionala, 67, kv. 222; Julia Alexeevna Larionova, prospekt Elizarova, 12, kv. 15; Alexandr Leibovich Klebansky, ulitsa Zhelyabova, 10, kv. 107, all of Leningrad; Vsevolod Volfovich Berenblit, Vsevolozhsky raion, poselok Kuzmolovsky, ulitsa Nagornaya, 23, kv. 10; Jury Pavlovich Dolnakov, Krasnoe selo, ulitsa Narvskaya, 4, kv. 122, both of Leningradskaya oblast; Lev Moiseevich Yagupolsky, ulitsa Ivana Kudri, 41, kv. 48, Kiev; Vladlen Vasilievich Malovik, ulitsa Osipovskogo, 4/5, kv. 6, Kiev; Miron Onufrievich Lozinsky, ulitsa Voroshilova, 18, kv. 13, Kiev; Viktor Mikhailovich Belous, ulitsa Ujutnaya, 5a, kv. 3, Odessa; Boris Efimovich Gruz, ulitsa Kurskaya, 10, kv. 18, Kiev; Ljubov Antonovna Alexeeva, Proletarsky bulvar, 41, kv. 28, Odessa; Anatoly Kirillovich Ankudinov, ulitsa Lensoveta, 10, kv. 203, and Rufina Mikhailovna Ryazanova, Vitebsky prospekt, 81, korpus 1, kv. 6, both of Leningrad, all of U.S.S.R.

Filed Apr. 29, 1976, Ser. No. 681,521
Int. Cl.² C07F 7/12
U.S. Cl. 260—448.2 B **4 Claims**

1. [Perfluoroalkyl(alkoxy)phenyl]methyldichlorosilanes having the general formula

(I).



where: $R_F = OCF_3$, OC_2F_5, $OC_2F_4OCF_3$, $C_2F_4OCF_3$, C_3F_7

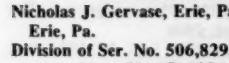
4,031,120

ISOCYANATOSILANE ADDUCTS

Nicholas J. Gervase, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Division of Ser. No. 506,829, Sept. 17, 1974. This application May 7, 1976, Ser. No. 684,417
Int. Cl.² C07F 7/10, 7/18
U.S. Cl. 260—448.8 R 13 Claims

1. An isocyanatosilane characterized by the presence of at least one reactive isocyanate group and containing a single silane grouping having the structure



said reactive isocyanate group being connected to said silane grouping through a divalent organic radical having at least one carbon atom, and wherein

R is a divalent aliphatic, cycloaliphatic or aromatic radical having from 1 to 20 carbon atoms;

R^1 is a monovalent aliphatic, cycloaliphatic or aromatic radical having from 1 to 20 carbon atoms;

R^2 is a monovalent aliphatic, cycloaliphatic or aromatic organic radical having from 1 to 8 carbon atoms; and

a is zero or 1.

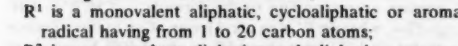
4,031,121

ORGANOBROMOSILICONE FLUIDS

Paul L. Brown, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sept. 22, 1976, Ser. No. 725,318
Int. Cl.² C07F 7/18
U.S. Cl. 260—448.8 R 8 Claims

1. A silicone fluid having a general formula



wherein each R is selected from the group consisting of hydrocarbon radicals containing from 1 to 18 carbon atoms, fluorinated hydrocarbon radicals containing from 1 to 18 carbon atoms, chlorinated hydrocarbon radicals containing from 1 to 18 carbon atoms and cyanohydrocarbon radicals containing from 1 to 18 carbon atoms, and *x* has a value of from 1 to 20.

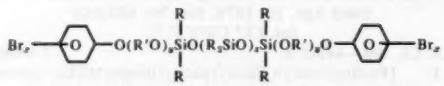
4,031,122

ARYLORGANOBROMOSILICONE COMPOUNDS

Paul L. Brown, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sept. 22, 1976, Ser. No. 725,219
Int. Cl.² C07F 7/18
U.S. Cl. 260—448.8 R 7 Claims

1. A silicone compound having the general formula



wherein

x has an average value of from 2 to 3,

R′ is selected from the group consisting of ethylene, propylene, and butylene radicals,

y has a value of from 1 to 10,

R is selected from the group consisting of hydrocarbon radicals containing from 1 to 18 carbon atoms, fluorinated hydrocarbon radicals containing from 1 to 18 carbon atoms, chlorinated hydrocarbon radicals containing from 1 to 18 carbon atoms and cyanohydrocarbon radical containing from 1 to 18 carbon atoms, and

z has a value of from 0 to 25.

4,031,123

METHANOL PRODUCTION IN A PARAFFINIC MEDIUM

Ramon L. Espino, New York, and Thomas S. Pletzke, Cambria Heights, both of N.Y., assignors to Chem Systems Inc., New York, N.Y.

Filed Nov. 21, 1975, Ser. No. 634,182
The portion of the term of this patent subsequent to June 10, 1992, has been disclaimed.
Int. Cl.² C07C 29/16
U.S. Cl. 260—449.5 6 Claims

1. A process for the production of methanol from feed gas containing hydrogen and carbon oxides in a hydrogen to carbon monoxide molar ratio of from 0.6/1 to 10/1 comprising passing said feed gas into a reaction zone containing methanol-forming catalyst particles in a paraffinic or cycloparaffinic inert liquid compound having from 6 to 30 carbon atoms at temperatures from 150° to 400° C and pressures from 200 to 10,000 psia, said conditions being selected so that the equivalent methanol concentration in the liquid corrected to 250° C and 1000 psig does not exceed 1.0 percent by weight, and withdrawing vapors containing methanol product.

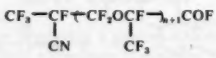
4,031,124

CYANOPERFLUOROETHER ACID FLUORIDES AND THEIR PREPARATION

James E. Nottke, Greenville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 472,420, May 22, 1974, Pat. No. 3,933,767, which is a division of Ser. No. 262,590, June 14, 1972, Pat. No. 3,852,326. This application Oct. 16, 1975, Ser. No. 622,891
Int. Cl.² C07C 120/00, 121/453
U.S. Cl. 260—465.4 7 Claims

1. An acid fluoride of the formula



where *n* is an integer from 0 to 4.

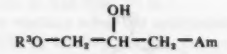
4,031,125

3-SULFONATE ESTER OF 2,3-DIHYDROXYPROPYLAMINE

Leonard M. Weinstock, Belle Mead; Roger J. Tull, Metuchen, and Dennis M. Mulvey, Milford, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 417,301, Nov. 19, 1973, Pat. No. 3,962,338, which is a continuation-in-part of Ser. No. 172,231, Aug. 16, 1971, abandoned, which is a division of Ser. No. 818,474, April 21, 1969, Pat. No. 3,657,237. This application Oct. 24, 1975, Ser. No. 625,616
Int. Cl.² C07C 143/68
U.S. Cl. 260—456 A 4 Claims

1. An optically active glycolamine in the sinister configuration substantially completely free from the rectus isomer having the structure



wherein R^3 is lower alkylsulfonyl, benzenesulfonyl or mono- to tri-substituted benzenesulfonyl wherein the substituents are similar or dissimilar and are lower alkyl, lower alkoxy, halo, amino or nitro; Am is the amino group or monoloweralkyl-substituted amino.

4,031,126

DRYING OF DIALKYL PEROXYDICARBONATES

James A. Manner, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 12, 1976, Ser. No. 657,526
Int. Cl.² C07C *68/08*
U.S. Cl. 260—463 8 Claims

1. A process for reducing the dissolved water content of dialkyl peroxydicarbonate, which comprises:

contacting liquid dialkyl peroxydicarbonate with molecular sieves which selectively adsorb water from the peroxydicarbonate, the peroxydicarbonate containing dissolved water but being substantially free of phase water.

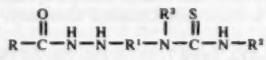
4,031,127

ACYL HYDRAZINO THIOUREA DERIVATIVES AS PHOTOGRAPHIC NUCLEATING AGENTS

Ronald E. Leone; Wayne W. Weber, II, and Donald P. Wrathall, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 601,888, Aug. 6, 1975, abandoned. This application June 29, 1976, Ser. No. 700,982
Int. Cl.² C07C *121/52*, *121/60*, *157/09*; G03C *5/30*
U.S. Cl. 260—465 D 45 Claims

1. A compound having the formula

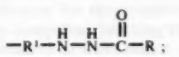


wherein

R is a hydrogen, phenyl, alkylphenyl, cyanophenyl, halophenyl, alkoxyphenyl, alkyl, cycloalkyl, haloalkyl, alkoxyalkyl or phenylalkyl substituent;

R^1 is a phenylene or alkyl, halo- or alkoxy substituted phenylene;

R^2 is an alkyl, haloalkyl, alkoxyalkyl or phenylalkyl substituent having up to 18 carbon atoms; a cycloalkyl substituent; phenyl or naphthyl; an alkylphenyl, cyanophenyl, halophenyl or alkoxyphenyl substituent or



R^3 is hydrogen, benzyl, alkoxybenzyl, halobenzyl or alkylbenzyl;

said alkyl moieties, except as otherwise noted, in each instance include from 1 to 6 carbon atoms; and

said cycloalkyl moieties have from 3 to 10 carbon atoms.

4,031,128

METHOD OF PREPARING ACRYLONITRILE

Khachik Egorovich Khcheyan, Volokolamskoe shosse, 1, kv. 55; Olga Mikhailovna Revenko, B. Pirogovskaya ulitsa, 29/31, kv. 107; Alla Nikolaevna Shatalova, Fortunatovskaya ulitsa, 27, kv. 1; Eleonora Grigorievna Gelperina, Schelkovskoe shosse, 44, korpus 1, kv. 19; Lidia Ivanovna Agrinskaya, Chertanovskaya ulitsa, 44, kv. 270, and Georgy Avanesovich Muradian, Suschevsky val, 23, kv. 40, all of Moscow, U.S.S.R.

Filed Apr. 22, 1976, Ser. No. 679,498
Int. Cl.² C07C *120/00*
U.S. Cl. 260—465.9 4 Claims

1. A method of preparing acrylonitrile comprising reacting acetonitrile with methane in a molar ratio of 1:0.5–8, at a temperature within the range of from 650 to 1,000° C at a space velocity of from 1,000 to 23,000 hr^{-1} in the presence of oxygen or a mixture thereof with an inert gas and a catalyst selected from the group consisting of potassium bromide, potassium chloride, calcium bromide, bismuth oxide, molybdenum oxide and a mixture of bismuth oxide and molybdenum oxide, followed by isolation thereof.

4,031,129

15-DEOXY-PGE, AND METHOD FOR PREPARING SAME

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 26, 1972, Ser. No. 221,058
Int. Cl.² C07C *177/00*
U.S. Cl. 260—468 D 4 Claims

1. dl-15-deoxyprostaglandin E_1.

3. A method for preparing dl-15-deoxyprostaglandin E_1 which comprises:

alkylating lithium cyclopentadiene with ethyl-7-bromoheptanoate at ice bath temperatures

oxygenating the resulting alkylated cyclopentadiene with singlet oxygen-producing reactants to produce an isomeric mixture of hydroxycyclopentenones

chromatographically separating the said mixture and recovering 2-(6′-carboethoxyhexyl)-4-hydroxy-cyclopenten-1-one

reacting the said recovered hydroxy ester with up to about four molar equivalent of dihydropyran in the presence of an acid catalyst and recovering 2-(6′-carboethoxyhexyl)-2-cyclopentene-4-tetrahydropyranoxy-1-one from the reaction mixture

reacting the said ether with 1-lithium-1-trans-octene in the presence of stoichiometric amounts of soluble tri-n-butylphosphine-copper iodide complex and recovering the formed prostanoic acid derivative from the reaction mixture

removing the tetrahydropyranyl group from the said derivative and chromatographically recovering dl-15-deoxoprostaglandin E_1 ethyl ester and

exposing the said ester to the action of an esterase-producing microorganism and recovering dl-15-deoxy-prostaglandin E_1 from the reaction mixture.

4,031,130

ALIPHATIC β-KETO ESTERS

Günter Renner; Immo Boie, and Quirin Scheben, all of Cologne, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 11, 1975, Ser. No. 557,268
Claims priority, application Germany, Mar. 16, 1974, 2412784
Int. Cl.² C07C *69/74*
U.S. Cl. 260—468 K 11 Claims

1. In a process for the production of an aliphatic β-keto ester by gradually adding a dialkyl ketone selected from the group consisting of pinacolone and methyl isopropyl ketone into a solution of dialkyl carbonate and a basic condensation agent which is capable of catalysing the ketone condensation reaction, said condensation agent being in a molar ratio of 1:1 or more based on the ketone, whereby said condensation reaction mixture is heated to a temperature of from 20° to 80° C until a reaction product is obtained and subsequently the reaction product obtained is acidified to produce the aliphatic β-ketoester, the improvement according to which the condensation reaction is carried out in the presence of at least 0.1 mol of hexamethyl phosphoric acid triamide per mol of the said dialkyl ketone in the condensation reaction mixture.

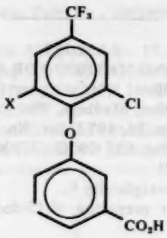
4,031,131

PROCESS FOR PREPARING PHENOXYBENZOIC ACIDS

Wayne O. Johnson, Warminster, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sept. 29, 1975, Ser. No. 617,561
Int. Cl.² C07C *69/76*
U.S. Cl. 260—473 G 10 Claims

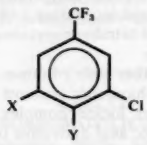
1. A method for preparing a compound of the formula



wherein X is a hydrogen atom or a chlorine atom, which comprises

a. reacting 3-hydroxybenzoic acid with at least two equivalents of an inorganic base to form the disalt of the 3-hydroxybenzoic acid,

b. reacting in a polar aprotic organic solvent the disalt with a benzotrifluoride of the formula



wherein Y is a chlorine atom or a fluorine atom and X is as defined above, and

c. acidifying the product of (b) with a strong inorganic acid.

4,031,132

ISOPROPENYL CYCLOPENTENE CARBOXYLIC ACIDS

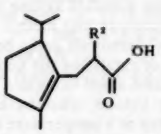
Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 490,166, July 19, 1974, Pat. No. 3,963,675, which is a division of Ser. No. 338,730, March 7, 1973, abandoned. This application Sept. 23, 1975, Ser. No. 615,964

Int. Cl.² C07C *61/38*

U.S. Cl. 260—514 L **3 Claims**

1. A cyclopentene of the general formula



(Ib)

wherein R^2 represents a hydrogen atom or a lower alkyl group and the broken line denotes an optional bond.

4,031,133

PHENYLACETIC ACIDS

Jacques Georges Maillard, Paris, France, assignor to Laboratoires Jacques Logeais, Issy-les-Moulineaux, France

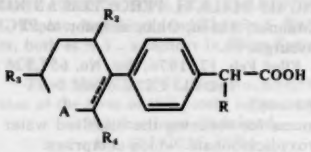
Filed Aug. 31, 1972, Ser. No. 285,127

Claims priority, application United Kingdom, Sept. 4, 1971, 41327/71

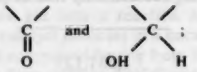
Int. Cl.² C07C *65/02*; A01N *9/00*

U.S. Cl. 260—520 R **4 Claims**

1. Compounds having the formula:



in which A is selected from the group consisting of



R, R_2, R_3 and R_4 are each selected from the group consisting of hydrogen and alkyl groups; and their pharmaceutically acceptable salts; the number of carbon atoms in alkyl groups R and R_3 being from 1 to 4, and in R_2 and R_4 being from 1 to 8.

4,031,134

PHENOXY CARBOXYLIC ACID DERIVATIVE

Yasushi Nakamura, Ibaragi; Kunio Agatsuma; Yoshihiro Tanaka, both of Takarazuka, and Shunji Aono, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

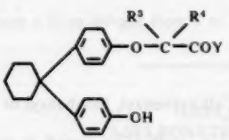
Division of Ser. No. 26,412, April 7, 1970, Pat. No. 3,716,583. This application Sept. 25, 1972, Ser. No. 292,110

Claims priority, application Japan, Apr. 16, 1969, 44-029905; Apr. 16, 1969, 44-029907; May 2, 1969, 44-034166; May 2, 1969, 44-034167; Oct. 3, 1969, 44-080041; Oct. 3, 1969, 44-080042; Dec. 19, 1969, 44-102809; Dec. 23, 1969, 44-104194

Int. Cl.² C07C *65/14, 69/76*

U.S. Cl. 260—520 C **3 Claims**

1. A phenoxyaliphatic carboxylic acid derivative of the formula,



wherein R^3 is methyl, R^4 is methyl, ethyl, or n-propyl and Y is hydroxyl or C_1-C_4 alkoxy.

4,031,135

MANUFACTURE OF ACRYLIC ACID BY OXIDATION OF PROPYLENE WITH OXYGEN-CONTAINING GASES IN TWO SEPARATE CATALYST STAGES

Heinz Engelbach, Limburgerhof; Richard Krabetz, Kirchheim; Gerd Duembgen, Dannstadt-Schauernheim; Carl-Heinz Willersinn, Ludwigshafen; Ulrich Lebert, Ludwigshafen, and Fritz Thiessen, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen Rhine, Germany

Filed July 11, 1975, Ser. No. 595,321

Claims priority, application Germany, July 31, 1974, 2436818

Int. Cl.² C07C *51/32*

U.S. Cl. 260—530 N **3 Claims**

1. In a process for the manufacture of acrylic acid by oxidation of propylene with a gas containing molecular oxygen in two spatially separate oxidation stages wherein an acrolein-selective catalyst containing molybdenum, bismuth and iron in an oxidic form which at a bath temperature below 380° C and

a residence time of up to 4 seconds is able to produce, in a single pass, a conversion of more than 80 mole% of the propylene employed is used in the first stage, and a catalyst containing molybdenum and vanadium in an oxidic form, which is selective for acrylic acid and which at a bath temperature below 350° C and a residence time of up to 4 seconds is able to produce, in a single pass, a conversion of more than 80% of the acrolein is used in the second stage, and in the oxidation a part of the off-gas, which has been substantially freed from condensable products, including water, and essentially consists of nitrogen and small amounts of unconverted propylene, oxygen, propane and carbon monoxide and carbon dioxide, is fed to the oxidation in addition to fresh propylene and air, the improvement which comprises

a. feeding the recycled off-gas and air in part to the first oxidation stage and in part to the second oxidation stage,
b. maintaining the molar ratio of propylene : oxygen : residual gases in the feed to the first stage at 1 :1.5–2.3 : 11–19,
c. maintaining the molar ratio of the total propylene fed in, to the total oxygen fed in, in the form of air or off-gas, before and after the first stage, and to the total residual gases fed in, at 1 : 1.9–2.5 : 13–25, with the proviso that
d. the air and recycled off-gas are divided between the two feed points in such a way that from 10 to 50% by volume of the total quantity of air and off-gas fed in is added after the first stage, and
e. admixing the air and off-gas to the reaction gas mixture after the first stage, immediately after it leaves the catalyst zone, so that the mixture is rapidly cooled to a temperature of from 150° to 320° C.

4,031,136
PROCESS FOR THE PREPARATION OF TRANS, TRANS-MUCONIC ACID

Lorenz Heiss, Hofheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 22, 1976, Ser. No. 651,263
Claims priority, application Germany, Jan. 28, 1975, 2503313
Int. Cl.² C07C *51/09*
U.S. Cl. 260—537 N **2 Claims**

1. Process for the preparation of trans, trans-muconic acid, which comprises reacting a glyoxalacetal with ketene at a temperature of from minus 30° to plus 60° C in the presence of a Lewis acid catalyst and hydrolyzing the β, β'-dialkoxy-adipic acid-alkylester formed with alkali.

4,031,137
CATALYSTS BASED ON CARBON SUPPORTS AND USE IN CATALYTIC DEOXIDATION PROCESS

Joseph Lawrence Schmitt, Jr., Bethel, Conn.; Philip Leroy Walker, Jr., State College, Pa., and George Augustus Castellion, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 559,997, March 19, 1975, Pat. No. 3,978,000. This application Feb. 11, 1976, Ser. No. 657,115
Int. Cl.² C07C *103/19*
U.S. Cl. 260—559 AT **13 Claims**

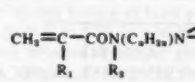
1. A process for the catalytic reduction of 6-hydroxynaphthacenes so as to form the corresponding 6-deoxy derivative thereof which comprises reducing a polar solvent solution of a 6-hydroxy hydronaphthacene with hydrogen in the presence of a catalyst composition comprising a porous carbon particulate support comprising carbon black spheres in packed relationship and bonded with a carbonized binder, said spheres having a particle size in the range of about 80 to 5000 angstrom units and said particulate having a pore volume of at least about 0.2 cubic centimeter per gram and a pore size distribution exhibiting peaks at a pore radius in excess of 10 angstrom units and, carried on said support, an effective amount of a platinum group metal, until about one mole of hydrogen has been absorbed for each mole of starting material used, and recovering the 6-deoxy derivative so formed.

4,031,138
STABLE SUBSTITUTED ACRYLAMIDES OR METHACRYLAMIDES

Edward C. Y. Nieh, and Philip H. Moss, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,171
Int. Cl.² C07C *103/133*
U.S. Cl. 260—561 N **11 Claims**

1. A stable N-(ω-monoalkylaminoalkyl) acrylamide or methacrylamide monomer characterized by the following structural formula:



where R_1 and R_2 are hydrogen or methyl, R_3 is isopropyl or t-butyl and n is 2 or 3, with the proviso that when R_1 is hydrogen, R_3 is t-butyl.

4,031,139
MANUFACTURE OF CYCLOHEXANONE OXIME

Guenther Rapp; Hugo Fuchs, both of Ludwigshafen, and Erwin Thomas, Freinsheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen Rhine, Germany

Filed Jan. 26, 1976, Ser. No. 652,421
Claims priority, application Germany, Feb. 26, 1975, 2508247
Int. Cl.² C07C *131/04*
U.S. Cl. 260—566 A **2 Claims**

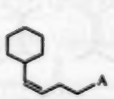
1. An improved process for the manufacture of cyclohexanone oxime by reaction of cyclohexanone with an aqueous hydroxylammonium/ammonium sulfate solution at temperatures above the melting point of cyclohexanone oxime by the countercurrent method, the improvement comprising: carrying out the reaction in the absence of solvents and neutralizing and/or buffering salts at pHs of 0.5 or less until a state of equilibrium is reached, removing the oxime produced during the reaction from the aqueous phase and extracting the aqueous phase with cyclohexanone and then subjecting the extracted aqueous phase to steam distillation.

4,031,140
4- AND 5-PHENYL PENTENAL ACETALS

William Lewis Schreiber, Jackson, N.J.; Gerard Joseph Mosciano, Newtown, Pa.; Alan O. Pittet, Atlantic Highlands; Manfred Vock, Locust, both of N.J., and Edward Joseph Shuster, New York, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 507,542, Sept. 19, 1974, which is a division of Ser. No. 283,632, Aug. 25, 1972, Pat. No. 3,862,340. This application Apr. 12, 1976, Ser. No. 676,394
Int. Cl.² C07C *43/30*
U.S. Cl. 260—611 A **3 Claims**

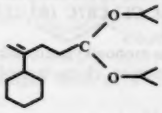
1. A compound having the structure:



wherein A is the moiety:

and wherein R_b and R_b' separately are the same or different lower alkyl.

3. A compound having the structure:

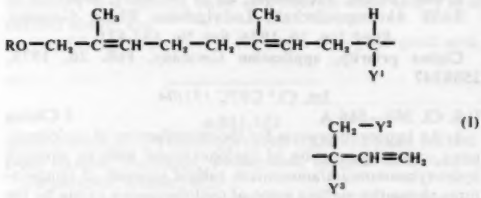


4,031,141
12-ALKOXY-3,7,11-TRIMETHYL-DODECATETRAENES

Werner Hoffmann, Neuhofen, and Manfred Baumann, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 9, 1976, Ser. No. 703,956
Claims priority, application Germany, July 23, 1975, 2532851
Int. Cl.² C07C *43/00, 43/14*
U.S. Cl. 260—614 R 2 Claims

1. A compound of the general formula I



(I)

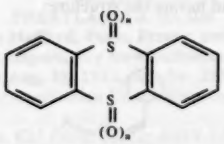
where R is CH_3, C_2H_5, n-C_3H_7 or iso-C_3H_7 and Y^1 and Y^2 are different and each is hydrogen or, together with Y^3, is an additional bond between the carbon atoms carrying Y^1 and Y^3, or Y^2 and Y^3, respectively.

4,031,142
PROCESS FOR THE DIRECTED CHLORINATION OF ALKYLBENZENES

John C. Graham, Warren, Mich., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Aug. 1, 1975, Ser. No. 601,690
Int. Cl.² C07C *25/04*
U.S. Cl. 260—650 R 12 Claims

1. A process for the preparation of nuclear chlorinated alkylbenzenes which comprises reacting an alkylbenzene with chlorine at a temperature of about 0° to about 100° Celsius and in the presence of a catalyst system comprising a Lewis acid catalyst and a thianthrene co-catalyst characterized by the formula



where each *n* is 0 to 1.

4,031,143
REDUCTION USING $NaAlEt_2H_2$

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 5, 1973, Ser. No. 337,902
Int. Cl.² C07C *29/00*
U.S. Cl. 260—632 D 4 Claims

1. In a process for reducing a reducible compound by an addition reaction to $NaAlEt_2H_2$ followed by hydrolysis to remove the aluminum and recovering a reduced product, the improvement wherein the product from the addition reaction is subjected to oxidation with molecular oxygen prior to the hydrolysis whereby al—C_2H_5 bonds contained therein are converted to al—O—C_2H_5 bonds.

4,031,144
CHLORINATION OF TOLUENE

Eugene P. Di Bella, Piscataway, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Mar. 22, 1976, Ser. No. 669,438
Int. Cl.² C07C *25/28*
U.S. Cl. 260—650 R 9 Claims

1. The process for the production of monochlorotoluene containing at least 45 percent of parachlorotoluene which comprises contacting toluene with chlorine until from 0.7 to 1.1 gram atoms of chlorine has reacted per mole of toluene at a temperature in the range of −20° to 70° C. and in the presence of a catalyst system that comprises a ferrocene compound selected from the group consisting of ferrocene, alkyl-substituted ferrocenes derived from cyclopentadienes having as substituent one or two lower alkyl groups, and mixtures thereof and a co-catalyst selected from the group consisting of sulfur, sulfur monochloride, sulfur dichloride, carbon disulfide, and mixtures thereof in the amount of at least 0.1 part by weight of said co-catalyst per part by weight of the ferrocene compound.

4,031,145
PROCESS FOR THE PRODUCTION OF 3,4-DICHLOROTOLUENE

Eugene P. Di Bella, Piscataway, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Mar. 22, 1976, Ser. No. 669,440
Int. Cl.² C07C *25/04*
U.S. Cl. 260—650 R 10 Claims

1. The process for the production of dichlorotoluene containing at least 35 percent of 3,4-dichlorotoluene which comprises contacting para-chlorotoluene with chlorine until from about 0.6 gram atom to 0.9 gram atom of chlorine has reacted per mole of para-chlorotoluene in the presence of a catalyst system selected from the group consisting of

a. a ring-chlorination catalyst selected from the group consisting of iron, ferrocene, chlorides of iron, aluminum, zirconium, thallium, tin, indium, molybdenum, gallium, tungsten and mixtures thereof and a co-catalyst selected from the group consisting of sulfur, sulfur monochloride, sulfur dichloride, and carbon disulfide in the amount of at least 0.1 part by weight of the co-catalyst per part by weight of the ring-chlorination catalyst; b. a sulfide of a metal selected from the group consisting of iron, aluminum, zirconium, thallium, tin, indium, molybdenum, gallium, tungsten, and mixtures thereof; and

c. mixtures thereof, in the amount of at least 0.1 gram of the ring-chlorination catalyst or metal sulfide per mole of parachlorotoluene and at a temperature in the range of −20° C. to 70° C. to form a reaction mixture that contains from 50 percent to 70 percent by weight of dichlorotoluene and separating from said reaction mixture a dichlorotoluene fraction containing at least 35 percent of 3,4-dichlorotoluene.

4,031,146

PROCESS FOR THE PRODUCTION OF 2,5-DICHLOROTOLUENE

Eugene P. Di Bella, Piscataway, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Mar. 22, 1976, Ser. No. 669,439
Int. Cl.² C07C *25/04*
U.S. Cl. 260—650 R 14 Claims

1. The process for the production of dichlorotoluene containing at least 55 percent of 2,5-dichlorotoluene which comprises contacting ortho-chlorotoluene with chlorine until from about 0.5 gram atom to 0.9 gram atom of chlorine has reacted per mole of ortho-chlorotoluene in the presence of a catalyst selected from the group consisting of

a. a ring-chlorination catalyst selected from the group consisting of iron, ferrocene, chlorides of iron, aluminum, zirconium, thallium, tin, indium, molybdenum, gallium, and tungsten and mixtures thereof and a co-catalyst selected from the group consisting of sulfur, sulfur monochloride, sulfur dichloride, and carbon disulfide in the amount of at least 0.1 part by weight of the ring-chlorination catalyst;

b. a sulfide of a metal selected from the group consisting of iron, aluminum, zirconium, thallium, tin, indium, molybdenum, gallium, and tungsten and mixtures thereof; and

c. mixtures thereof, in the amount of at least 0.1 gram of the ring-chlorination catalyst or metal sulfide per mole of ortho-chlorotoluene and at a temperature in the range of −20° C. to 70° C. to form a reaction mixture that contains from 50 percent to 75 percent by weight of dichlorotoluenes and separating from said reaction mixture a dichlorotoluene fraction containing at least 55 percent of 2,5-dichlorotoluene.

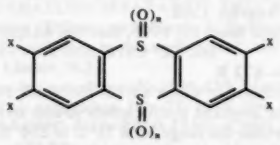
4,031,147

PROCESS FOR DIRECTED CHLORINATION OF ALKYLBENZENES

John C. Graham, Warren, Mich., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Aug. 1, 1975, Ser. No. 601,219
Int. Cl.² C07C *25/04*
U.S. Cl. 260—650 R 34 Claims

1. A process for the preparation of nuclear chlorinated alkylbenzenes which comprises reacting an alkylbenzene with chlorine at a temperature of about −25° to about 150° Celsius and in the presence of a Lewis acid catalyst and a co-catalyst comprising a thianthrene compound or mixture of thianthrene compounds characterized by the formula:



where each *n* is 0 to 1 and each *x* is hydrogen or an electron-withdrawing substituent with the proviso that at least one *x* is an electron-withdrawing substituent.

4,031,148

METHOD OF SEPARATING CHLORINATED ALIPHATIC HYDROCARBONS FROM MIXTURES THEREOF BY LIQUID-LIQUID EXTRACTION

Jacques Helgorsky, Eaubonne, France, assignor to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 437,516, Jan. 28, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 666,05(
Claims priority, application France, Jan. 30, 1973, 73.03179
Int. Cl.² C07C *17/38*
U.S. Cl. 260—652 P 7 Claims

1. A method of at least partial separation of mixtures of at least two C_1 to C_3 chlorinated aliphatic hydrocarbons selected from the group consisting of CCl_4, $CHCl_3$, C_2H_5Cl, $C_2H_4Cl_2$, $C_2H_3Cl_3$, $C_2H_2Cl_4$, C_2HCl_5, C_2Cl_6, C_2H_3Cl, $C_2H_2Cl_2$, C_2Cl_4, $C_3H_6Cl_2$, and C_2HCl_3, comprising liquid-liquid extraction on such mixtures, in the presence of one or more extraction agents having at least partial water-miscibility, and adding from 0 to 50% by weight of water, the extraction agents being selected from the group consisting of dimethylsulfoxide, dimethylformamide, sulfolane, C_1 and C_2 alkylated derivatives of sulfolane, N-methylpyrrolidone, hexamethylphosphotriamide, propylene carbonate, ethylene carbonate, ethylene glycol, propylene glycol, glycerol, diethylene glycol, triethylene glycol, tetraethylene glycol, dipropylene glycol, polyethylene and polypropylene glycols having a molecular weight of less than 600, furfuryl alcohol, tetrahydrofurfuryl alcohol, 2-methoxy ethanol, 2-ethoxy ethanol, 2-butoxy ethanol, 2-(2-methoxy ethoxy) ethanol, 2-(2-ethoxy ethoxy) ethanol, and 2-(2-butoxy ethoxy)

4,031,149

LOW TEMPERATURE CATALYTIC COMBUSTION OF CHLOROHYDROCARBONS

Jamal S. Eden, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed July 22, 1974, Ser. No. 490,513
Int. Cl.² C07C *21/00*
U.S. Cl. 260—654 A 13 Claims

1. In the process of producing chlorinated derivatives of ethylene which includes the step of oxyhydrochlorination whereby hydrogen chloride is reacted with oxygen and ethylene, the improvement which comprises separating in a stream from said process any unwanted chlorinated ethylene derivatives and other by-products, injecting said stream into a combustion catalyst bed comprised of 5% to 20% by weight of UO_3 and 95% to 80% by weight of a material selected from the group consisting of Al_2O_3, SiO_2 and a mixture of Al_2O_3 and SiO_2, injecting air into said bed along with said stream, maintaining said bed at a temperature in the range of about 350° C. to about 450° C. to produce a mixture of hot combustion gases containing essentially hydrogen chloride and being essentially free of both elemental chlorine and chlorohydrocarbon materials, and recycling said mixture of gases to said oxyhydrochlorination step.

4,031,150

CATALYTIC DIMERIZATION OF NORBORNADIENE TO BINOR-S

George Suld, Springfield; Abraham Schneider, Overbrook Hills, and Harry K. Myers, Jr., Green Ridge, all of Pa., assignors to Suntech, Inc., St. Davids, Pa.

Filed Nov. 14, 1975, Ser. No. 631,978
Int. Cl.² C07C *13/28*; C06B *43/00*; B01J *31/12*
U.S. Cl. 260—666 PY 2 Claims

1. Process for the catalytic dimerization of norbornadiene comprising:

a. reacting a feed consisting essentially of norbornadiene in the presence of an effective amount of a two-component catalytic system of tris(triphenylphosphine) rhodium chloride and one of the following: diethylaluminum chlor-

ide, ethylaluminum dichloride and aluminum ethylsesquichloride; and wherein the range of mole ratio of norbonadiene to tris(triphenylphosphine) rhodium chloride is between from about 100 to about 1000; and wherein the range of mole ration of diethylaluminum chloride or ethylaluminum dichloride or aluminum ethylsesquichloride to tris(triphenylphosphine) rhodium chloride is between from about 0.5 to about 100; and wherein the reacting occurs in the presence of a suitable solvent selected from the group consisting of aromatic hydrocarbons, cycloparaffins, halogenated aromatics, halogenated paraffins and halogenated cycloparaffins; and thereby provides a homogeneous reaction medium;

b. the reacting occurring within a temperature range between from about 25° to about 150° C; and

whereby the major product is Binor-S.

4,031,151
SEPARATION OF HYDROCARBONS

Frank J. Healy, Morristown, and Paul R. Geissler, Edison, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 556,432, March 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 457,056, April 1, 1974, abandoned. This application May 12, 1976, Ser. No. 685,459

Int. Cl.² C07C 7/13; C10G 25/04; B01D 15/08

U.S. Cl. 260—666 A **35 Claims**

1. In a process for continuously separating, in a liquid phase, the components of a liquid hydrocarbon feedstream wherein at least one of said components is selectively adsorbed by contact with a solid sorbent utilizing a simulated countercurrent flow system wherein liquid streams are allowed to flow downward through a desorption zone, a rectification zone and a sorption zone, each zone being serially and circularly interconnected and divided into a plurality of serially interconnected sections, each section being packed with a mass of said solid sorbent, the improvement which comprises:

a. introducing a first desorbent stream containing a desorbent and a C_8-C_{18} paraffinic diluent into the first section of said desorption zone;

b. withdrawing a desorption effluent containing a selectively sorbed component from the last section of said desorption zone;

c. introducing a second desorbent stream containing said paraffinic diluent and at least about 10 weight percent of said desorbent into the first section of said rectification zone;

d. introducing said hydrocarbon feedstream into the first section of said sorption zone;

e. withdrawing a raffinate effluent containing a less sorbed component from the last section of said sorption zone; and

f. wherein the concentration of said desorbent present in the first desorbent stream is higher than the concentration of said desorbent present in the second desorbent stream by at least 20 weight percent.

4,031,152
PREPARATION OF DERIVATIVES OF CYCLOBUTANE AND CYCLOBUTENE

Joachim H. Lukas; Frank Baardman, and Adriaan P. Kouwenhoven, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

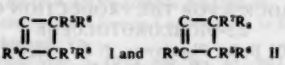
Division of Ser. No. 468,949, May 10, 1974, Pat. No. 3,965,204. This application Dec. 22, 1975, Ser. No. 643,419

Claims priority, application United Kingdom, May 10, 1973, 22362/73

Int. Cl.² C07C 3/03, 13/06

U.S. Cl. 260—666 A **12 Claims**

1. A process for the preparation of cyclobutene derivatives having the formulas



I and II

in which formulas I–II R^5 and R^8 each individually represents a primary or secondary alkyl group, R^6 and R^7 a hydrogen atom, a primary or secondary alkyl group, R^9 an alkyl group and R^5 and R^8 each individually represents a hydrogen atom when R^7 represents a primary or secondary alkyl group having at least 2 carbon atoms and R^8 a primary or secondary alkyl group, which process comprises contacting an alkene having the formula

$$R^5R^6C = CR^7R^8 \qquad \text{III}$$

with a 1-alkyne having the formula

$$HC \equiv CR^9 \qquad \text{IV}$$

R^5, R^6, R^7, R^8 and R^9 in the formulas III–IV having the same meanings as in the formulas I–II, in the liquid phase in the presence of a dissolved Lewis acid derived from an element of Group III A of the Periodic Table of the Elements, titanium, tin, antimony, tantalum, rhenium, iron or zinc.

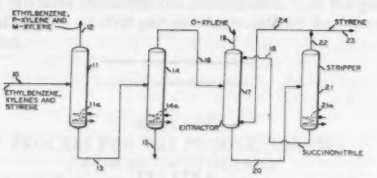
4,031,153
SEPARATION OF STYRENE FROM XYLENES

Donald M. Haskell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 25, 1975, Ser. No. 616,717

Int. Cl.² C07C 15/00

U.S. Cl. 260—669 A **12 Claims**



1. The method of separating styrene from a mixture comprising styrene, ethylbenzene, para-xylene, ortho-xylene and meta-xylene, which comprises fractionating the mixture to obtain a stream which consists essentially of ortho-xylene and styrene; introducing said stream consisting essentially of ortho-xylene and styrene into an intermediate region of a liquid-liquid extraction column; introducing a stream of succinonitrile into an upper region of said column; removing a raffinate stream enriched in ortho-xylene from the upper region of said column; removing an extract stream of succinonitrile enriched in styrene from the lower region of said column; and separating styrene from said extract stream.

4,031,154
BENZENE BY HYDROGENATIVE DEALKYLATION

Robert Raynold Edison, Olympia Fields, and Thorpe Dresser, Markham, both of Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 15, 1975, Ser. No. 613,379

Int. Cl.² C07C 3/58

U.S. Cl. 260—672 R **10 Claims**

1. In the method in which a fresh feedstock consisting predominantly of aromatic hydrocarbon stream having a boiling point range within the range from 75° C to 230° C, is subjected to hydrodealkylation in a hydrodealkylation zone to prepare lower boiling normally liquid products of the group consisting of xylene, toluene, and benzene, the improvement which consists of recycling to extinction the naphthalene content of

the crude reaction stream, whereby some of the recycled naphthalene is converted in the hydrodealkylation zone to products of said group of xylene, toluene, and benzene, the concentration of naphthalene in the total feedstock comprising recycle and fresh feedstock being maintained at a concentration less than about 10 percent by weight of total feedstock.

4,031,155
DUAL DESORBENT COMPOSITION AND TEMPERATURE SEPARATION PROCESSES

Frank J. Healy, Morristown, and Paul R. Geissler, Edison, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 617,491, Sept. 29, 1975, abandoned, which is a continuation of Ser. No. 457,056, April 1, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,897

Int. Cl.² C10G *25/04*; B01D *15/08*; C07C *7/13*

U.S. Cl. 260—674 SA **21 Claims**

1. In a process for continuously separating, in a liquid phase, the components of a liquid C_8 aromatic feedstream wherein at least one of said components is selectively adsorbed by contact with a solid sorbent material utilizing a simulated countercurrent flow system wherein liquid streams are allowed to flow downward through a desorption zone, a rectification zone and a sorption zone, each zone being serially and circularly interconnected and divided into a plurality of serially interconnected sections, each section being packed with a mass of said solid sorbent material, wherein said continuous separation is achieved by:

i. introducing a desorbent stream into the first section of said desorption zone;

ii. withdrawing a desorption effluent comprising at least one selectively sorbed component from the last section of said desorption zone;

iii. introducing said C_8 aromatic feedstream into the first section of said sorption zone; and

iv. withdrawing a raffinate effluent comprising a less sorbed component from the last section of said sorption zone,

the improvement which comprises:

a. introducing a first desorbent stream comprising a desorbent material selected from the group consisting of toluene, m-diisopropylbenzene, p-diethylbenzene, o-dichlorobenzene and a mixture of diethylbenzene isomers in an amount ranging from about 40 to about 100 weight percent and an inert paraffinic material having from 8 to 16 carbon atoms in an amount ranging from 0 to 60 weight percent into the first section of said desorption zone; and

b. introducing a second desorbent stream comprising said desorbent material in an amount ranging from about 10 to about 60 weight percent and said inert paraffinic material in an amount ranging from about 40 to about 90 weight percent into the first section of said rectification zone and wherein the concentration of said desorbent material present in the second desorbent stream is lower than the concentration of said desorbent material present in the first desorbent stream by at least 20 weight percent.

4,031,156
SEPARATION AND RECOVERY OF ETHYLBENZENE BY DUAL DESORBENT COMPOSITION AND TEMPERATURE SEPARATION PROCESSES

Paul R. Geissler, Edison, and Frank J. Healy, Morristown, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 556,435, March 7, 1975, abandoned. This application July 27, 1976, Ser. No. 708,924

Int. Cl.² C07C *7/13*; B01D *15/08*; C10G *25/04*

U.S. Cl. 260—674 SA **19 Claims**

1. In a process for continuously separating, in a liquid phase, the components of a liquid C_8 aromatic feedstream containing ethylbenzene wherein at least one of said components is selectively adsorbed by contact with a solid sorbent material, utilizing a simulated countercurrent flow system wherein liquid streams are allowed to flow downward through a desorption zone, a rectification zone and a sorption zone, each zone being serially and circularly interconnected and divided into a plurality of serially interconnected sections, each section being packed with a mass of said solid sorbent material, the improvement which comprises:

a. introducing a first desorbent stream containing a desorbent and a diluent into the first section of said desorption zone;

b. withdrawing a desorption effluent containing a selectively sorbed component from the last section of said desorption zone;

c. introducing a second desorbent stream containing said diluent and at least about 15 weight percent of said desorbent into the first section of said rectification zone;

d. introducing said hydrocarbon feedstream into the first section of said sorption zone;

e. withdrawing a raffinate effluent containing a less sorbed component from the last section of said sorption zone; and

f. wherein the concentration of said desorbent present in the first desorbent stream is higher than the concentration of said desorbent present in the second desorbent stream by at least 20 weight percent.

4,031,157
METHOD FOR REMOVING ACETYLENIC COMPOUNDS FROM SATURATED, OLEFINIC AND DIENIC HYDROCARBONS OR MIXTURES THEREOF

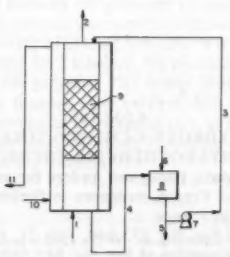
Carlo Rescalli, and Antonio Pacifico, both of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed May 21, 1975, Ser. No. 579,691

Claims priority, application Italy, May 21, 1974, 23011/74; Mar. 21, 1975, 21517/75

Int. Cl.² C07C *7/04*

U.S. Cl. 260—676 R **1 Claim**



1. A method for removing acetylenic compounds from saturated, olefinic or dienic hydrocarbons or their mixtures which comprises removing said acetylenic compounds from said saturated, olefinic or dienic hydrocarbons or their mixtures by etherification with an alcohol or a glycol in presence of an acid ion-exchange resin, containing mercuric ions and subsequently removing the produced ethers by distillation.

4,031,158

METHOD FOR PREPARATION OF POLYOLEFIN OIL

Hiroshi Isa; Toshiyuki Ukigai, both of Yachiyo; Anri Tominaga, Tokyo; Ryozo Taniyasu, Narashino, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed July 22, 1976, Ser. No. 707,614

Claims priority, application Japan, July 29, 1975, 50-92198

Int. Cl.² C07C *3/18*

U.S. Cl. 260—683.15 B **6 Claims**

1. A method of preparing a polyolefin oil comprising polymerizing an olefin having 6 or more carbon atoms at a temperature in the range of from 50 to 150° C in the presence of a catalyst mixture consisting of a polyhydric alcohol derivative and an aluminum halide, said derivative being obtained by replacing hydrogen atoms of all the hydroxyl groups of the polyhydric alcohol by alkyl groups having 1 to 20 carbon atoms.

4,031,159

METHOD FOR PREPARATION OF POLYOLEFIN OIL

Hiroshi Mandai, Chiba; Toshiyuki Ukigai, Yachiyo; Anri Tominaga, Higashi-Iko, and Michito Sato, Yokohama, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed July 22, 1976, Ser. No. 707,612

Claims priority, application Japan, July 29, 1975, 50-92199

Int. Cl.² C07C *3/18*

U.S. Cl. 260—683.15 B **8 Claims**

1. A method of preparing a polyolefin oil comprising polymerizing an olefin having 6 or more carbon atoms at a temperature in the range of from 50° to 150° C in the presence of a catalyst mixture consisting of a polyester and an aluminum halide, said polyester being obtained by esterifying all the carboxyl groups of a polycarboxylic acid having 2 to 20 carbon atoms with an aliphatic saturated alcohol having 1 to 20 carbon atoms.

4,031,160

2-AMINO-4-HYDROXY-5-CHLORO TOLUENE AND THE HYDROCHLORIDE THEREOF

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne-sur-Seine, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 273,810, July 21, 1972, abandoned, which is a continuation of Ser. No. 841,569, July 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 525,291, Feb. 7, 1966, Pat. No. 3,591,323. This application June 30, 1975, Ser. No. 592,051

Claims priority, application France, May 6, 1965, 65.16140

Int. Cl.² C07C *91/42*; A61K *7/12*; D06P *1/32*

U.S. Cl. 260—575 **2 Claims**

1. 2-amino-4-hydroxy-5-chloro toluene and its hydrochloride salt.

4,031,161

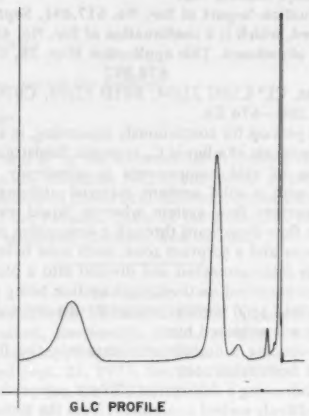
PROCESS FOR PRODUCING MIXTURE CONTAINING 4-(4'-METHYL-4'-HYDROXYAMYL)-Δ^3-CYCLOHEXENE CARBOXALDEHYDE

James Milton Sanders, Eatontown; William I. Taylor, Summit; Ira D. Hill, Locust, and John J. Kryschuk, Howell, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

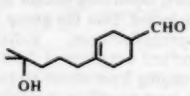
Filed June 9, 1976, Ser. No. 694,391

Int. Cl.² C07C *45/00*

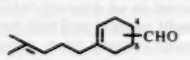
U.S. Cl. 260—598 **10 Claims**



1. A process for producing a mixture containing a major proportion of 4-(4'-methyl-4'-hydroxyamyl)-Δ^3-cyclohexene carboxaldehyde having the structure:



comprising the step of intimately admixing myrac aldehyde having the structure:



with a hydrating reagent selected from the group consisting of:

i. mixture of lower alkanoic acid and p-toluenesulfonic acid;

ii. mixture of 30% aqueous sulfuric acid and tetrahydrofuran;

iii. mixture of 30% sulfuric acid and dimethyl formamide;

iv. mixture of 50% sulfuric acid and tetrahydrofuran;

v. mixture of 65% sulfuric acid and acetic acid;

vi. mixture of methane sulfonic acid and tetrahydrofuran;

vii. sulfonated co-polymer of styrene and divinyl benzene cation exchange resin;

viii. mixture of (a) sulfonated co-polymer of styrene and divinyl benzene cation exchange resin and (b) lower alkanoic acid; or

ix. mixture of aqueous hydrochloric acid and a lower alkanol

at a temperature in the range of from 0° C up to 120° C, the reaction being carried out over a period of time varying from 1 hour up to 48 hours and the concentration of hydrating

reagent in the reaction mass varying from about 3 up to about 50%, the reaction being carried out in the presence of water.

4,031,162

POLYMER FILM WITH NARROW MOLECULAR WEIGHT DISTRIBUTION AND SARAN AND LAMINATES THEREOF

Harri J. Brax; Joseph F. Porinchak, both of Spartanburg, and Alan S. Weinberg, Greenville, all of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 344,005, March 22, 1973, which is a division of Ser. No. 129,501, March 30, 1971, Pat. No. 3,741,253. This application Jan. 2, 1976, Ser. No. 646,081

Int. Cl.² C08L *63/00, 27/00*

U.S. Cl. 260—837 PV **5 Claims**

1. A saran composition useful for melt extruding to form a film or the like comprising a blend of

a. 5–40 weight percent of a polymer of vinylidene chloride prepared by a suspension polymerization method and

b. 60–95 weight percent of a polymer of vinylidene chloride prepared by an emulsion polymerization method,

said polymers each containing at least 50% by weight of vinylidene chloride.

4,031,163

HARDENABLE RESINS BASED UPON ALLYL COMPOUNDS

Norbert Vollkommer, Troisdorf, and Werner Trautvetter, Troisdorf-Spich, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Mar. 25, 1975, Ser. No. 561,717

Claims priority, application Germany, Mar. 26, 1974, 2414364

Int. Cl.² C08G *45/04*

U.S. Cl. 260—837 R **37 Claims**

1. A cross-linked polymer having (in percent by weight):

a. Between 22 and 76 units of a residue of a nuclearly brominated or chlorinated xylyleneglycolbisallylether;

b. Between 11 and 54 units of a residue of maleic acid anhydride;

c. Between 6 and 57 units of a residue of a 1,2 epoxy compound.

4,031,164

LACTAM-POLYOL-POLYACYL LACTAM TERPOLYMERS

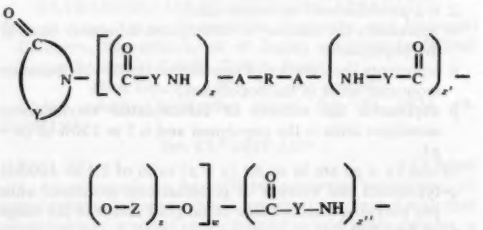
Ross Melvin Hedrick, Creve Coeur, and James D. Gabbert, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 477,134, June 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 341,215, March 14, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,654

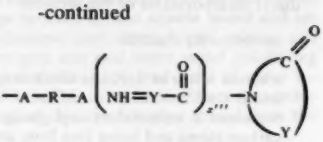
Int. Cl.² C08L *77/00*; C08G *69/16*

U.S. Cl. 260—857 PG **34 Claims**

1. A lactam-polyol-polyacyl lactam terpolymer having the general formula:



-continued



wherein $(O—Z)_z$ is a polyol segment having a molecular weight of at least 62 and Z is a hydrocarbon or substituted hydrocarbon group said group being alkylene, arylene, alkylene carbonyl, arylene carbonyl, and mixtures thereof;

A is a carbonyl group;

R is a divalent or polyvalent hydrocarbon group;

Y is an alkylene or substituted alkylene having from about 3 to about 14 carbon atoms;

x, x', x'', and x''' are integers and the total number of x's is equal to $2w + 2$;

z and w are integers of equal to one or more;

and said lactam-polyol-polyacyl lactam block terpolymers are comprised of at least about 18 to about 90 percent by weight of polyol blocks.

4,031,165

PROCESS FOR PREPARING POLYESTER ELASTOMERS

Noritsugu Saiki; Yoshihiko Takeuchi, and Hiroshi Sakai, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sept. 29, 1975, Ser. No. 617,844

Claims priority, application Japan, Sept. 30, 1974, 49-111644; Oct. 3, 1974, 49-113284; Oct. 11, 1974, 49-116163; Oct. 11, 1974, 49-116164; Mar. 14, 1975, 50-30196; Mar. 27, 1975, 50-36121

Int. Cl.² C08G *81/00, 63/04*

U.S. Cl. 260—860 **6 Claims**

1. In a process for preparing a block copolyester elastomer having a softening point of at least 120° C by reacting an aromatic polyester (I) having a reduced viscosity of at least 0.4 and derived from an aromatic dicarboxylic acid or its ester-forming derivative as a main acid component with an aliphatic polyester (II) having a reduced viscosity of at least 0.4 and derived from an aliphatic dicarboxylic acid or an aliphatic hydroxycarboxylic acid or an ester-forming derivative of each of these acids in the molten state; the improvement wherein

A. the aromatic polyester (I) is derived from a dicarboxylic acid component more than 70 mole % of which consists of terephthalic acid and diol component more than 70 mole % of which consists of tetramethylene glycol or trimethylene glycol,

B. the weight ratio of the aromatic polyester (I) to the aliphatic polyester (II) is 0.25 to 9, and

C. the reaction between the polyester (I) and the polyester (II) is carried out until a polymer is obtained which has an elasticity recovery of at least 50% after it is stretched 20% and then relaxed for 5 minutes, the reaction of the polyester (I) with the polyester (II) being carried out in the presence of a titanium-type catalyst, and after the reaction has proceeded to the stage of (C), at least one compound selected from the group consisting of phosphorus compounds of the formula

wherein R_1 and R_2 are identical to, or different from, each other, and represent a hydrogen atom, an alkyl, cycloalkyl, aralkyl or aryl group each containing not more than 20 carbon atoms or OR_3 in which R_3 represents a metal, ammonium or the same group or atom as R_1 independently from R_1,

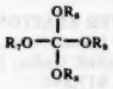
diaryl dicarboxylates of the formula

$$AOOC - X_n - COOB$$

wherein n is 0 or 1, X is a divalent organic group, and A and B are identical to, or different from, each other and represent a monovalent aryl group containing 6 to 20 carbon atoms and being free from an ester-forming functional group,

carbonic acid esters of the formula

wherein R_4 and R_5 are identical to, or different from, each other, and represent an aryl group containing no ester-forming functional group, and ortho-carbonate compounds of the formula



wherein R_6, R_7, R_8 and R_9 are identical to, or different from, each other, and represent a monovalent aryl group containing no ester-forming functional group,

being added in an amount which stops or inhibits the above reaction.

4,031,166

IMPACT-RESISTANT POLYSTYRENE, α-OLEFIN, BLOCK COPOLYMER BLENDS

Klaus Bronstert, Carlsberg; Gerhard Fahrbach, Schwetzingen; Eduard Krahe, Altrip; Volker Ladenberger, Schwetzingen, all of Germany; Ernst-Guenther Kastning, late of Assenheim, Germany (by Marie-Louise Hermine Kastning, heiress-at-law); Hans Mittnacht, Mannheim, Germany; Herbert Willersinn, Ludwigshafen, Germany, and Hans-Georg Trieschmann, Hambach, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 108,169, Jan. 20, 1971, abandoned. This application Feb. 19, 1974, Ser. No. 443,750

Claims priority, application Germany, Jan. 29, 1970, 2003916

Int. Cl.² C08L *53/02, 23/04, 23/10, 9/06*

U.S. Cl. 260—876 B **8 Claims**

1. An impact-resistant thermoplastic molding material for forming rigid products containing a mixture of:

A. from 70 to 99% by weight of a high molecular weight homopolymer of styrene or of a high molecular weight copolymer of styrene with up to 60% by weight of a styrene derivative bearing a substituent on the nucleus or a side chain; and

B. from 30 to 1% by weight of a soft component consisting essentially of a mixture of:

1. an α-olefin polymer and

2. a substantially gel-free uncrosslinked block copolymer of 15 to 60% by weight of a vinyl aromatic and 85 to 40% by weight of a diene hydrocarbon which has been prepared by anionic solution polymerization,

the relative weight ratio of (1) to (2) being from 15:1 to 1:3.

4,031,167

CROSSLINKING FLUOROCARBON COMPOSITIONS USING POLYALLYLIC ESTERS OF POLYCARBOXYLIC ACIDS

Elihu J. Aronoff, Framingham, and Kewal Singh Dhami, Shrewsbury, both of Mass., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 402,302, Oct. 1, 1973, Pat. No. 3,911,192. This application June 5, 1975, Ser. No. 584,136

Int. Cl.² C08L *27/14, 27/16, 27/18, 27/20*

U.S. Cl. 260—884 **7 Claims**

1. A polymeric composition comprising a fluorocarbon polymer and a blend of at least two polyallylic esters, said polyallylic esters in said blend being incorporated in said mixture in an amount sufficient to promote crosslinking of said polymer, one of said polyallylic esters being a diallylic ester of a dicarboxylic acid in which the carboxylic groups are connected by an organic radical selected from the group consisting of alkylene, cycloalkylene, mixed alkylene-cycloalkylene and aralkylene radicals, and the other of said polyallylic esters being selected from the group consisting of triallyl esters and tetraallyl esters of aromatic and heterocyclic aromatic carboxylic acids and triallyl esters of isocyanuric acid, the ratio of said esters in said blend in such proportions so as to produce a combination of elongation and deformation resistance in said polymer which is greater than the average of such properties obtained with the individual esters when used alone.

4,031,168

COPOLYMERS OF ISOBUTYLENE AND A VINYLBENZENE AND GRAFT POLYMERS THEREOF WITH PIVALOLACTONE

William Henry Sharkey, and John Ferguson Harris, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 508,886, Sept. 24, 1974, abandoned. This application Sept. 25, 1975, Ser. No. 616,839

Int. Cl.² C08L *23/22*

U.S. Cl. 260—896 **8 Claims**

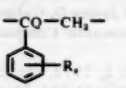
1. A graft copolymer of the formula

$$X_mY_nY'_p(Z_q)_r$$

wherein

X is an isobutylene monomer unit,

Y is a vinylbenzene monomer unit of the formula



in which

Q is hydrogen or lower alkyl

R is halogen, lower alkyl, chloro lower alkyl, lower alkoxy, or two adjacent R's together are methylenedioxy, and

s is an integer from 0 to 5,

Y' is a carboxylated Y unit,

Z is a pivalolactone monomer unit,

m represents the number of isobutylene monomer units in the copolymer,

n represents the number of non-carboxylated vinylbenzene monomer units in the copolymer,

p represents the number of carboxylated vinylbenzene monomer units in the copolymer and is 5 to 100% of $(n+p)$,

m and $(n+p)$ are in an m: $(n+p)$ ratio of 2:1 to 1000:1,

q represents the number of pivalolactone monomer units per polypivalolactone side chain graft and is in the range of 2 to 500,

r represents the number of polypivalolactone side chain

grafts in the graft copolymer and is substantially equal to p,

X, Y and Y′ are randomly interconnected through carbon to carbon linkages with single Y and Y′ units predominantly connected only to X units,

Z_q is a single polypivalolactone side chain grafted to a Y′ unit through the carboxyl group, and

$(Z_q)_r$ is 3 to 80% by weight of the graft copolymer, and the copolymer has an $X_mY_nY'_p$ equivalent weight per carboxyl group of 200 to 1×10^5.

4,031,169

THERMOPLASTIC ELASTOMERIC POLYMER BLEND

Harris L. Morris, Woodbridge, Conn., assignor to Uniroyal Inc., New York, N.Y.

Filed Sept. 11, 1975, Ser. No. 612,419

Int. Cl.² C08L *23/16*

U.S. Cl. 260—897 A **15 Claims**

1. A thermoplastic, elastomeric and reprocessable polymer blend comprising

A. 30 to 90 parts by weight of a terpolymer rubber of (i) ethylene, (ii) an alpha-monoolefin having the structure $CH_2{=}CH{-}R$ wherein R is an alkyl radical having from 1 to 12 carbon atoms, the ratio of ethylene to alpha-monoolefin being from 70/30 to 85/15 by weight, and (iii) dicyclopentadiene, and

B. correspondingly 70 to 10 parts by weight of a polyolefin resin,

the said terpolymer (A) having a zero shear viscosity not greater than 0.5×10^9 poises at 135° C, and the said blend having an ultimate tensile strength of at least 1000 psi, an elongation at break of at least 100%, and an elongation set at break not greater than 50%.

4,031,170

PHOSPHORUS COMPOUNDS

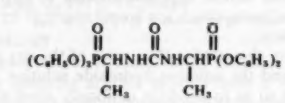
Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 385,779, Aug. 6, 1973, Pat. No. 3,954,860. This application July 14, 1975, Ser. No. 595,956

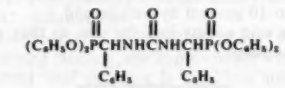
Int. Cl.² C07F *9/40*

U.S. Cl. 260—932 **4 Claims**

1. As a composition of matter



2. As a composition of matter



4,031,171

ULTRASONIC AIR HUMIDIFYING APPARATUS

Makoto Asao, Tokyo; Susumu Ito, Yokosuka, and Hidetoshi Umehara, Sagamihara, all of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

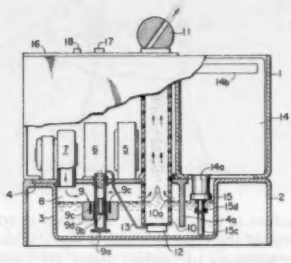
Filed Dec. 23, 1975, Ser. No. 643,867

Claims priority, application Japan, Dec. 25, 1974, 49-156751[U]

Int. Cl.² B01F *3/04*

U.S. Cl. 261—1 **12 Claims**

1. An ultrasonic air humidifying apparatus comprising an upper cabinet, a lower cabinet separably connected with said upper cabinet, a water vessel formed in said lower cabinet, a chassis board interposed between said upper cabinet and lower cabinet, a high frequency generator fixed on said chassis board, a conduit pipe secured to said chassis board and extending upward in its upper part through said cabinet and extending in its lower part into said water vessel and having holes in a position just above a standard level of water received in said water vessel, an ultrasonic vibrator assembly fixed to the lower end of said conduit pipe spaced from the



bottom of said water vessel and connected with said high frequency generator to produce mist from the water within said conduit pipe, a motor-blower fixed on said chassis board for introducing air into said conduit pipe through said holes and conveying the mist within said conduit pipe, and a water supply means for maintaining the water level in said water vessel constant.

4,031,172

PROCESS FOR PREPARING NITROCELLULOSE FOR USE IN SMALL ARMS

Edward H. Zeigler, Cumberland, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 544,529, Jan. 27, 1975. This application Sept. 28, 1976, Ser. No. 727,555

Int. Cl.² G21C *21/00*

U.S. Cl. 264—3 B **5 Claims**

1. A process for preparting colloided nitrocellulose for use in small arms having a gravimetric loading density of at least 0.95 gm/ml., said process comprising,

a. preparing a syrup of nitrocellulose in diethylene glycol monomethyl ether, said nitrocellulose containing 13.35%N (minimum) and said syrup comprising from about 5% to about 35% by weight of nitrocellulose,

b. adjusting viscoty of said syrup to about 3000 centipoises,

c. forcing said viscosity-adjusted syrup under sufficient pressure into a streaming head containing about 90 orifices to extrude through said orifixs, each of said orifices being about 0.0135 inch in diameter,

d. vibrating said streaming head while said pressurized syrup is flowing therethrough to form falling droplets of said syrup about 14 inches below said streaming head, said vibrations being imparted to said streaming head in a direction parallel to the gravitational path of said falling droplets,

e. introducing said droplets into a gelling bath comprising an aqueous solution of diethylene glycol monomethyl ether, said bath solution containing at the initial point of contact with the droplets from about 30% to about 50% by weight of water and from about 50% to about 70% by weight of diethylene glycol monomethyl ether to rapidly gel the surface of the droplet so that no substantial distortion of the droplet occurs,

f. leaching the gelled droplet in the presence of water until substantially all of the diethylene glycol monomethyl ether in the gelled droplet has been replaced by water, and

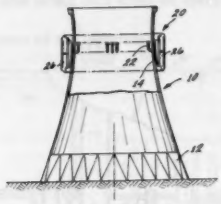
g. subjecting the resulting water-swollen gel to drying conditions to produce a colloided nitrocellulose having a gravimetric loading density of at least 0.95 gm/ml.

4,031,173

EFFICIENCY AND UTILIZATION OF COOLING TOWERS

Paul Rogers, 1801 Century Park East, Los Angeles, Calif. 90067

Filed Mar. 25, 1976, Ser. No. 670,122
Int. Cl.² F03D 9/00; F23L 17/02
U.S. Cl. 261—24 7 Claims



1. In a structure of the character described in combination, a cooling tower of the type in which a vertical draft of air is produced for purposes of cooling water for condensing exhaust steam, means comprising a rotor carried by the tower at an elevated position and means whereby the rotor rotates around the vertical axis of the tower on the exterior thereof and is exposed to wind, the rotor being constructed whereby it is caused to rotate by prevailing winds, and means for transforming energy generated by rotation of the rotor.

4,031,174

PROCESS OF PRILLING MOLTEN MATERIALS

Frank William Bennett, Woodbridge, England, assignor to Fisons Limited, London, England

Continuation-in-part of Ser. No. 437,216, Jan. 28, 1974, abandoned. This application July 10, 1975, Ser. No. 594,674
Claims priority, application United Kingdom, Feb. 9, 1973, 6592/73; Apr. 18, 1973, 18609/73
Int. Cl.² B01J 2/04
U.S. Cl. 264—14 10 Claims

1. In a process of prilling a molten material in a cooling tower comprising:

A. directing falling droplets of a molten material selected from the group consisting of sulfur and fertilizer materials into a cooling tower having a zone formed by an upwardly flowing carrier gas stream to cool and at least partially solidify the molten droplets, and

B. collecting the at least partially solidified droplets at the bottom of the cooling tower and permitting all the droplets to completely solidify,

the improvement wherein

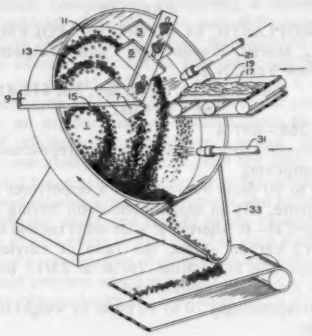
C. the carrier gas stream in said zone carries suspended therein, droplets of a volatile material having a mean drop diameter of 60 to 500 micrometers, said volatile material being such that it volatilizes into vapors on contact with the droplets of said molten material whereby heat is removed from the molten material droplets so as to cool and form at least a solidified skin on said droplets, said carrier gas being at least saturated with the vapors of the volatile material such that the carrier gas varies between a saturated and supersaturated state in respect to the vapors of volatile material, said carrier gas flowing counter-current to the molten droplets at a velocity of 0.1 to 10 meters per second with the proviso that the velocity of the carrier gas does not exceed the terminal velocity of the droplets of the falling molten material.

4,031,175

GLASS BATCH PELLETIZING METHOD

Joseph E. Cooper, Brakenridge, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 503,130, Sept. 4, 1974, and Ser. No. 622,296, Oct. 14, 1975, each is a continuation-in-part of Ser. No. 398,106, Sept. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 166,115, July 26, 1971, abandoned. This application Mar. 10, 1976, Ser. No. 665,642
Int. Cl.² B01J 2/12
U.S. Cl. 264—40.7 10 Claims



1. A method for forming particulate glass batch material into pellets having a controlled selected size range, comprising:

a. rotating in a clockwise direction a pelletizing disc inclined at about 40° to 55° from horizontal;

b. depositing onto the disc at approximately a four o'clock position a dry particulate glass batch mixture including sand, fine ground limestone, and fine ground dolomite, the mixture being at least about 20 percent by weight finer than 100 mesh and at least 15 percent by weight finer than 200 mesh;

c. spraying onto the disc on aqueous solution of 50 to 75 percent by weight alkali metal hydroxide;

d. permitting the materials deposited onto the disc and contacted with the alkali metal hydroxide solution to roll the disc and tumble over one another to form pellets of said dry mixture which are bound together by said aqueous solution;

e. controlling the relative flow rates of the dry glass batch mixture and the aqueous hydroxide solution in (b) and (c) above so as to produce uniformly sized pellets with uniform compositions;

f. controlling the moisture content of the materials on the disc so as to produce pellets having a moisture content of about 5 to 10 percent by weight; and

g. removing said pellets fom the disc as they attain a selected size range.

4,031,176

METHOD OF INJECTION MOLDING EXPANDED THERMOPLASTICS AND ARTICLES PRODUCED THEREBY

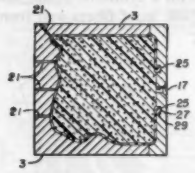
Robert A. Molbert, Salem, N.H., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed May 3, 1971, Ser. No. 139,644
Int. Cl.² B29D 27/00; B29C 1/04
U.S. Cl. 264—45.2 9 Claims

1. A method of injection molding an expanded thermoplastic article to achieve a smooth skin over a substantial portion thereof, comprising the steps of:

a. injecting through a sprue opening in a cavity formed by a pair of closed hard metal injection mold members that are maintained at a temperature below about 100° F., there

being attached about and over said sprue opening and interiorly of said cavity a smooth-surfaced, thin, nonporous cured elastic rubber membrane, a short-shot of non-expanded molten expandable thermoplastic into said cavity and against said membrane, while simultaneously increasing the cavity pressure to a level below the injection pressure and above the thermoplastic expansion pressure of said molten non-expanded expandable thermoplastic, so that said non-expanded molten expandable thermoplastic forms a pocket in said membrane and



gradually cools and develops a smooth, thin skin adjacent said membrane, and

b. releasing the cavity pressure to permit expansion of said thermoplastic and deformation of said membrane into full conformance with the interior surface of said mold cavity to form an expanded article having a smooth, thin skin over that portion in contact with said membrane, said membrane being non-adherent to and releasable from the skin of said article and from the interior surface of said mold cavity.

4,031,177

PROCESS FOR THE MANUFACTURE OF ARTICLES OF TRANSLUCENT ALUMINA

Alain Auriol, and Paul Tritten, both of Tarbes, France, assignors to Compagnie Generale d'Electroceramique, Paris, France

Continuation of Ser. No. 273,581, July 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 84,456, Oct. 27, 1970, abandoned. This application Oct. 17, 1975, Ser. No. 623,274

Claims priority, application France, Oct. 31, 1969, 69.37585; Aug. 3, 1971, 71.28434

Int. Cl.² F27B *9/04;* **F27D** *7/06*

U.S. Cl. 264—65 **6 Claims**

1. In a process for manufacturing articles of translucent alumina by sintering articles molded from a very pure fine powder containing a small portion of a grain-growth inhibiting substance, comprising the steps of:

a. preliminarily sintering said powder in an oxidizing atmosphere at a temperature between about 700° C and about 1100° C., followed by

b. final sintering at a temperature above 1700° C., in a nonoxidizing medium, the improvement which comprises conducting final sintering in a carbon monoxide atmosphere.

4,031,178

STRENGTH IMPROVEMENT IN MACHINED SIC BODIES

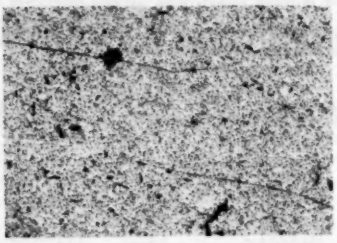
Curtis A. Johnson, and Svante Prochazka, both of Ballston Lake, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 9, 1976, Ser. No. 675,618

Int. Cl.² C04B *35/56*

U.S. Cl. 264—65 **8 Claims**

1. A method for increasing the fracture strength of a machined polycrystalline silicon carbide body having a density of at least 85% of the theoretical density of silicon carbide and containing silicon carbide in an amount of at least 90% by weight of said body, machining said body inducing surface irregularities which significantly limit the fracture strength thereof, and firing said machined body in an atmosphere ranging in pressure from about 10^{-3} torr to 25 torr wherein the residual gases have no significant deteriorating effect on said silicon carbide body at a temperature ranging from about



1400° C to 2100° C to increase the fracture strength thereof at room temperature by at least about 10% compared to that of the as-machined body, said body being free of constituent which are not chemically inert nor undergoe significant melting or vaporization at said firing temperature.

4,031,179

MANUFACTURE OF SHAPED ARTICLES OF FOAMED OLEFIN POLYMERS

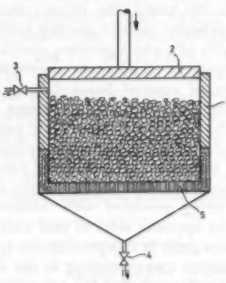
Hermann Tatzel, Leutershausen; Wolfram Koegel, Mannheim; Gilbert Beck, Ludwigshafen; Ludwig Zuern, Bad Duerkheim, and Arndt Christian Caesar, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 18, 1974, Ser. No. 480,404

Claims priority, application Germany, June 20, 1973, 2331304

Int. Cl.² B29F *5/02*

U.S. Cl. 264—91 **3 Claims**



1. A process for the manufacture of shaped articles of foamed olefin polymers consisting essentially of

a. providing a gas-tight shaping means or mold having at least one movable wall means;

b. introducing completely foamed crosslinked olefin polymer particles into said gas tight shaping means or mold;

c. heating said particles by passing a gaseous or liquid heating medium through the mold, to temperatures which are from 5 to 150° above the crystallite melting point of said polymer;

d. simultaneously mechanically compressing said particles by said movable wall means;

e. reducing the air pressure in said shaping means or mold prior to or during said compression to a valve which is at least 50 mm of Hg below ambient atmospheric pressure to form a sintered foamed crosslinked olefin polymer article;

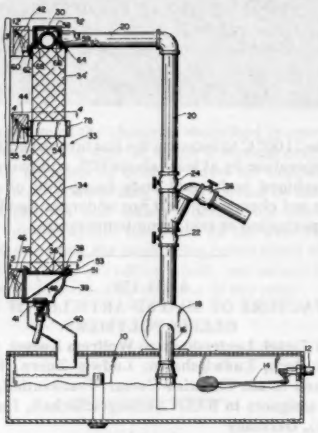
f. venting said mold and cooling said article; and,
g. removing said sintered foamed crosslinked olefin polymer article from said shaping means or mold.

4,031,180

COOLING PAD SYSTEM

Hoy R. Bohanon, Muskogee, Okla., assignor to Acme Eng. & Mfg. Corporation, Muskogee, Okla.

Filed June 22, 1976, Ser. No. 698,737
Int. Cl.² B01F *3/04*
U.S. Cl. 261—106 **6 Claims**



1. In an evaporative cooling system including a sump, a water conductor positioned along the top of an opening within a wall of a building and provided with a plurality of openings therealong, a pump for transferring water from the sump to the conductor, a gutter positioned along the bottom of the opening within the wall of the building, and a conduit connecting the gutter to the sump, the improvement comprising a plurality of individually distinct cooling cells, each cell consisting of a plurality of water absorbing sheets having corrugations, the corrugations of adjacent sheets intersecting each other, a plurality of support brackets positioned in spaced relationship along the gutter, a pan resting on said support brackets along the top of said gutter, said pan being provided with a plurality of openings therein, the bottom of said cooling cells resting on said pan, a plurality of pad cover brackets spaced apart from each other immediately above said water conductor and being provided with retainers on each side thereof located on opposite sides of said water conductor and terminating downwardly in flanges that are spaced apart from each other a distance corresponding to the distance between the faces of said cells such that the top portions of said cells are held securely between said flanges, and a plurality of pad covers connected between said pad cover brackets to form a continuous wall above said water conductor.

4,031,181

METHOD FOR MOLDING HIGH STRENGTH FACING

William H. Schaefer, and Richard E. Bender, both of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Continuation of Ser. No. 550,259, Feb. 18, 1975, abandoned, which is a division of Ser. No. 332,956, Feb. 15, 1973, Pat. No. 3,889,951, which is a continuation-in-part of Ser. No. 241,176, April 5, 1972, Pat. No. 3,840,230. This application May 10, 1976, Ser. No. 684,525
Int. Cl.² B29D *3/02*
U.S. Cl. 264—135 **4 Claims**

1. The method of making a reinforcing facing for a game racket having an open frame connected to an elongated handle by a throat area which comprises:
impregnating a tow of substantially continuous, substantially parallel high Young's modulus fibers with a synthetic resin;
arranging said tow in a mold having an open frame area connected to a handle area by a throat area;
molding said tow into a substantially U-shaped cross-section in the frame area, modified through the throat area to a substantially rectangular cross-section in the handle area;
impregnating at least two sheets of high Young's modulus fiber cloth with a synthetic resin, said cloth having from about 0 to 50% woof fibers and from about 50 to 100% warp fibers;

placing said at least two sheets of fiber cloth over said tow in said mold so as to contact the base of said U-shape and cover the frame area, handle area and throat area;
placing said sheets of cloth with the warp fibers in each succeeding layer in the frame area at an angle of at least about 45° to the fibers in the preceding layer and placing said layers of cloth in the handle area at an angle of at least 30° to the fibers in the preceding layer, the warp fibers in all layers in the handle area being placed at angles of no more than about 60° to the handle centerline; and
applying pressure to said mold and hardening said resin to form a unitary facing comprising fibers in a resin matrix.

4,031,182

RECOVERY OF ALUMINUM FROM ALUNITE ORE USING ACID LEACH TO PURIFY THE RESIDUE FOR BAYER LEACH

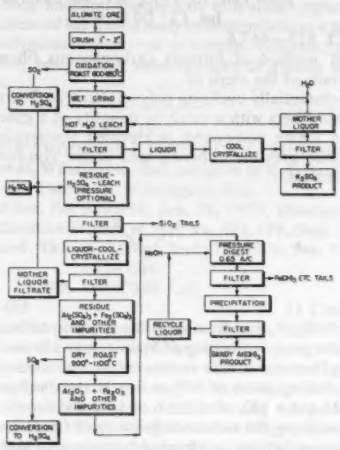
Kent W. Loest, Broomfield, Colo., assignor to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo., part interest to each

Filed Mar. 24, 1976, Ser. No. 669,621
Int. Cl.² C01F *7/06*, *7/14*
U.S. Cl. 423—127 **7 Claims**

1. A process for recovering aluminum hydroxide from alunite ore which comprises:
a. grinding the ore to particulate form;
b. oxidation roasting the particulate ore to remove water and sulfur and convert the aluminum values to alumina;
c. grinding the calcined ore;
d. leaching the roasted and ground ore with water to remove compounds of sulfur and alkali metal including potassium sulfate resulting in a residue containing aluminum values and silicates, and a solution containing soluble sulfates including K_2SO_4;
e. separating the residue and solution of step (d);
f. leaching said residue of step (d) with a 10 to 35 percent solution of sulfuric acid to convert the aluminum values therein to soluble aluminum sulfate, and leaving a residue containing SiO_2, said leaching process to be carried out at a temperature between about 120 and 180° C.
g. separating the residue of step (f) from the solution of step (f);
h. crystallizing aluminum sulfate from the solution of step (f);
i. calcining the aluminum sulfate of step (h) to drive off

sulfur dioxide and convert the aluminum sulfate to aluminum oxide;

j. digesting the calcined alumina of step (i) with caustic to convert the aluminum values therein to soluble aluminates;



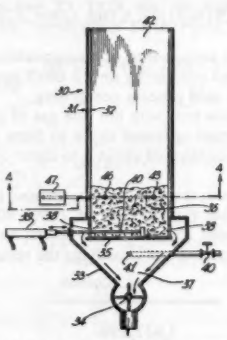
k. filtering the liquid of step (j) to remove insoluble impurities;

l. precipitating aluminum hydroxide from the filtered liquid of step (k).

4,031,183
PROCESS FOR CALCINING LIMESTONE

Terence Arthur Rourke, Upper Long Beach Road, R.R. 3, Nelson, B.C., Canada (V1P 5P6)

Continuation-in-part of Ser. No. 559,193, March 17, 1973, abandoned. This application Feb. 17, 1976, Ser. No. 658,576
Int. Cl.² C01F *11/06*
U.S. Cl. 423—175 **3 Claims**



1. A process for the continuous production of calcined lime from limestone in a vertical kiln in which fuel is supplied through a plurality of injectors circumferentially spaced around the kiln in a single horizontal plane spaced from the lower end of the kiln and combustion air is supplied to said kiln, from a level below said injectors, counter current to the flow of limestone, comprising:

a. charging limestone ranging in size up to about five inches to the top of said kiln for downward movement therethrough;

b. continuously blowing air upwardly through said kiln in an amount sufficient to support combustion, and injecting fuel at a pressure in the range between 200 and 15000 psi through each of said injectors in a predetermined sequence at a rate between 100 and 500 injections per injector per minute, each of said injections occurring in a time period between 0.02 and 0.2 seconds, with a time period of 0.1 to 0.5 seconds between injections, the time period between injections being longer than the time of the injections thereby establishing lamellar flow of fuel and air in said kiln; and

c. withdrawing calcined lime at the lower end of said kiln.

4,031,184
PROCESS FOR RECLAIMING CEMENT KILN DUST AND RECOVERING CHEMICAL VALUES THEREFROM

Andrew T. McCord, Snyder, N.Y., assignor to Donald L. Christensen, Bismarck, N. Dak., a part interest

Filed Jan. 14, 1976, Ser. No. 649,064
Int. Cl.² C01D *3/08*
U.S. Cl. 423—197 **10 Claims**

1. A process for reclaiming cement kiln dust in usable form and recovering the alkali values thereof comprising leaching the cement kiln dust at an elevated temperature with an aqueous solution of potassium chloride, treating the leached slurry of cement kiln dust with a relatively small amount of oily hydrocarbon in the order of 1% to 10% by weight based on the weight of solids in the slurry and a long chain fatty acid amounting to at least 0.1% by weight based on the weight of the added oily hydrocarbon to flocculate the solids in an aqueous phase, separating the solids, cooling the resulting aqueous phase to crystallize potassium chloride out of solution, and separating the crystallized potassium chloride from the solution.

4,031,185
PROCESS FOR MAKING NITROGEN OXIDES CONTAINED IN FLUE GAS HARMLESS

Hidetoshi Akimoto, Ibaraki; Ryuichi Kaji, Hitachi; Hideo Kikuchi, Hitachi; Yukio Hishinuma, Hitachi, and Yoshijiro Arikawa, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi K.K., both of, Japan

Filed Jan. 30, 1976, Ser. No. 653,949
Claims priority, application Japan, Feb. 3, 1975, 50-14182; Feb. 8, 1975, 50-16469; Feb. 8, 1975, 50-16470
Int. Cl.² B01D *53/34*
U.S. Cl. 423—239 **20 Claims**

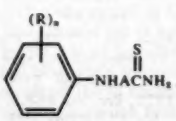
1. A process for removing nitrogen oxides in a flue gas by conversion to nitrogen and water comprising adding ammonia gas to a flue gas containing nitrogen oxides and passing the resulting mixed gas over a catalyst of cuprous or cupric halide selected from the group consisting of cuprous chloride, cuprous bromide, cupric chloride, cupric bromide, and cupric iodide.

4,031,186
ARYLAMINOALKYLTHIOAMIDES

Peter deBenneville, Philadelphia, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed July 10, 1975, Ser. No. 594,917
Int. Cl.² A61K *31/165*; C07C *153/063*
U.S. Cl. 424—324 **19 Claims**

7. A method for treating a stomach ulcer which comprises administering to a patient in need of such treatment an effective amount of a compound of the formula:



wherein A is hydrocarbylene containing from one to three

carbon atoms; R is methyl, methoxy, ethoxy, halo or two R radicals on adjacent carbon atoms of the benzene ring may be joined together to form 1,3-butadienylene and *n* is an integer having a value of two to three or the nontoxic pharmacologically acceptable acid addition salts.

4,031,187

PROCESS FOR THE PRODUCTION OF NITRIC ACID

Diego Barba; Fabrizio Battistoni; Candido D'Agostini, and Giorgio Macchi, all of Rome, Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 17, 1975, Ser. No. 641,613

Claims priority, application Italy, Dec. 20, 1974, 30827/74

Int. Cl.² C01B *21/04*

U.S. Cl. 423—392 **8 Claims**

1. A method for the production of nitric acid having a concentration of at least 98% by weight from a gaseous flow obtained by catalytic oxidation of ammonia and containing nitrogen oxide and water vapor, wherein said water is removed from said gaseous flow and said nitrogen oxide is converted into nitrogen peroxide, said peroxide is converted into superazeotropic nitric acid by chemical absorption in an aqueous solution of nitric acid and said superazeotropic nitric acid is submitted to distillation, which comprises: (a) introducing said gaseous flow at a temperature of 180°–200° C. at the bottom of a column for the condensation of said water and the oxidation of said nitrogen oxide, and introducing at the top of said column an aqueous solution of nitric acid having a concentration of from 40 to 60 wt.%; operating said column in countercurrent, at a pressure higher than the atmospheric one and not exceeding 10 atmospheres and at a temperature at the bottom of from the boiling point of the aqueous solution at 30 wt.% of HNO_3 to the boiling point of azeotrope HNO_3/H_2O and at a temperature at the top of from the condensation point of nitrogen peroxide to the condensation point of water vapor; recovering a gaseous flow containing the peroxide, practically devoid of water and nitrogen oxide at the top of the column, and nitric acid having a concentration ranging from 30 to 55 wt.% at the bottom; (b) recycling a portion of said nitric acid recovered in (a) to the top of the oxidation column after cooling and delivering the remaining portion at intermediate level of a distillation column operating at atmospheric pressure, so as to recover azeotropic nitric acid at the bottom and water vapor at the top; condensing said water vapor, recycling a portion of the latter as reflux and discharging the remaining portion; recycling said azeotropic acid at the top of the column of (a) after cooling, together with said recycle portion of nitric acid of (a); (c) liquefying said nitrogen peroxide recovered in (a) and bringing it into contact with a fraction of said remaining portion of water of (b), aqueous nitric acid and air in a chemical absorption stage to give superazeotropic nitric acid; and (d) distilling said superazeotropic nitric acid to produce nitric acid with a concentration of at least 98% by weight; said nitrogen peroxide recovered in (a) is fed at the bottom of an intermediate column for its physical absorption in a flow of superazeotropic nitric acid fed at the top of said intermediate column; said flow of superazeotropic nitric acid containing said absorbed nitrogen peroxide is fed at intermediate level of said distillation column of (d) wherein nitrogen peroxide is recovered at the top and a flow of superazeotropic nitric acid is extracted at the bottom, said flow of superazeotropic acid being delivered to the top of said intermediate column; a flow of aqueous nitric acid is also extracted from the bottom of said column of (d) for the purpose of providing said aqueous nitric acid delivered to stage (c); said nitrogen peroxide issuing from the top of said column of (c) is liquefied and provides the nitrogen peroxide feeding for said stage (c).

4,031,188

PROCESS FOR FORMING CARBONACEOUS FIBERS

Gunter A. Kohler, Grant Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1975, Ser. No. 549,785

Int. Cl.² D01F *9/22*

U.S. Cl. 423—447.6 **5 Claims**

1. A method of forming carbonaceous fibers consisting essentially of the steps of:

a. substantially cyclizing polyacrylonitrile fibers by treating said fibers with a catalytic quantity of a gaseous form of an amine compound at elevated temperature and elevated pressure, wherein said amine compound has the formula:

wherein R_1, R_2 and R_3 may be the same or different and comprise the group consisting of hydrogen and lower alkyl groups having from one to four carbon atoms, and wherein said amine has a boiling point of 60° or less at standard pressure (760 TORR) and a pK_b of about 6 or less; and

b. oxidizing the substantially cyclized fibers in an oxidizing atmosphere at an elevated temperature; and

c. carbonizing the oxidized fibers by heating said fibers to at least 1000° C. in an inert atmosphere.

4,031,189

PROCESS FOR PREPARING COMPOSITION CONTAINING CARBON AND LOW SULFUR, NITROGEN AND ASH CONTENT

Wilfried Gemmeke, Essen; Heinrich Werner, Wattenscheid; Heinz Echterhoff, Essen, and Erich Raulf, Castrop-Rauxel, all of Germany, assignors to Verkaufsgesellschaft fur Teererzeugnisse (VfT), Essen, Germany

Filed Feb. 25, 1976, Ser. No. 661,070

Claims priority, application Germany, Mar. 13, 1975, 2510876

Int. Cl.² C01B *31/02;* C10B *53/00, 57/00*

U.S. Cl. 423—449 **28 Claims**

1. Process for the preparation of a composition comprised mainly of carbon and containing only a small amount of ash, nitrogen and sulfur, said process comprising:

A. drying a hydrous soot with hot flue gas of about 600° C in a direct current-operated dryer to form a dried soot having a water content of about 5 to about 20 percent by weight;

B. carbonizing said dried soot in a vertical flue oven by heating at a flue temperature of about 900° to about 1300° C for about 25 to about 40 hours; and

C. drying, comminuting and classifying the resulting composition.

4,031,190

HIGH STRENGTH HALIDE ALLOYS

Enrique Bernal G., Minnetonka; Barry G. Koepke, Burnsville, and Ralph B. Maciolek, Bloomington, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 29, 1975, Ser. No. 617,350

Int. Cl.² C01B *7/24;* C01D *3/04, 3/22*

U.S. Cl. 423—466 **2 Claims**

1. A crack-free optical fine-grained polygonized halide alloy body formed by compressive hot working of a single crystal halide alloy body at temperature between about 150° C and about 300° C to form in the body a polygonized fine-grained structure the body consisting essentially of a solid solution of potassium chloride and at least 0.1% of a second halide of the group consisting of potassium bromide and rubidium chloride,

the amount of the second halide in the alloy being sufficient to prevent room temperature grain growth but being much less than the amount of potassium chloride and wherein the amount of the second halide in the alloy is insufficient to increase substantially the optical absorption at 10.6 microns by the halide body and also insufficient to increase substantially the brittleness of the halide body in comparison to a pure fine-grained polygonized body of potassium chloride, and wherein the alloy body has a yield strength of greater than about 3400 psi.

4,031,191

PROCESS FOR PRODUCING HYDROGEN FLUORIDE

Harry Otto Burrus, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 545,354, Jan. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 401,129, Sept. 27, 1973, abandoned. This application Sept. 29, 1976, Ser. No. 728,004

Int. Cl.² C01B 7/22

U.S. Cl. 423—485 **11 Claims**

1. In a process for producing HF by reacting a metal fluoride selected from the group consisting of alkali metal fluorides and alkaline earth metal fluorides with a mineral acid, the reaction product thereafter being cooled, where in said process sulfur deposits accumulate in the cooling equipment, the improvement comprising adding to the cooling equipment when said equipment is not being used to cool the reaction product, sufficient SO_3 to remove the sulfur deposits and thereafter emptying the equipment.

11. A process for removing sulfur deposits which accumulate in the cooling equipment in an HF manufacturing process consisting essentially of adding to the cooling equipment, when said equipment is not being used to cool the reaction product, sufficient SO_3 to remove the sulfur deposits and thereafter emptying the equipment.

4,031,192

METHOD OF HYGIENIC DISPOSAL OF CHLORINE-CONTAINING PLASTIC MATERIAL

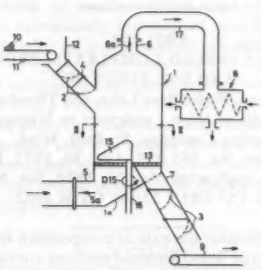
Robert J. Häfeli, Zurich, Switzerland, assignor to Von Roll AG, Gerlafingen, Switzerland

Filed Aug. 27, 1975, Ser. No. 608,281

Claims priority, application Switzerland, Sept. 5, 1974, 12060/74

Int. Cl.² C01B 7/08

U.S. Cl. 423—488 **8 Claims**



1. Method of hygienic disposal of scrap, waste, or refuse of high-polymer, chlorine-containing plastic material utilizing the steps of thermally treating the material in a closed vessel to thereby split off gaseous hydrochloric acid from said material and incinerating the essentially-free residue of the material remaining after the hydrochloric acid has been removed

comprising, in accordance with the invention, the steps of

placing the material on a steam pervious support in a closed vessel;

introducing super-heated steam from below said support through said support and through said material thereon to effect said thermal treatment step, said thermal treatment step comprising hydrolytically-thermally splitting off hydrochloric acid gas by thermally treating the chlorine-containing plastic material directly with super-heated steam by direct contact of said super-heated steam with said material in said vessel,

said super-heated steam forming a carrier gas for evolving gaseous hydrochloric acid being split off from the plastic material during said treatment;

removing the mixture of water, water-vapor and split-off gaseous hydrochloric acid from above the upper surface of said material on said support and evolving during said hydrolytic-thermal splitting step;

cooling and condensing said mixture of steam, water-vapor and split-off gas hydrochloric acid;

and wherein the step of introducing said superheated steam includes controlling the quantity of superheated steam supplied to said material in relation to said material and to the evolved hydrochloric acid gas which is split-off to result in gas-vapor mixture which, after the cooling and condensing step, has a maximum acid concentration of hydrochloric acid of 20.24%.

4,031,193

PROCESS FOR PREPARING CALCIUM FLUORIDE FROM HEXAFLUORO SILICIC ACID

Wilfried Becher, Heilbronn-Neckargartach, and Joachim Massonne, Hannover, both of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Feb. 14, 1975, Ser. No. 550,135

Claims priority, application Germany, Feb. 15, 1974, 2407238

Int. Cl.² C01F 11/22; C01B 33/14

U.S. Cl. 423—490 **2 Claims**

1. A process for the production of calcium fluoride, comprising the steps of reacting hexafluorosilicic acid having a concentration of between 10 to about 40% by weight with calcium carbonate in the presence of sulfate ion added in the form of a compound selected from the group consisting of iron-II sulfate and iron-III sulfate in a molar ratio of sulfate ion to hexafluorosilicic acid of between about 1:5 and 1:20 at a pH between about 2 and 6, whereby the sulfate ion provides for the formation of an easily separable mixture of calcium fluoride precipitate and aqueous silica sol, and separating said calcium flouride precipitate from said silica sol.

4,031,194

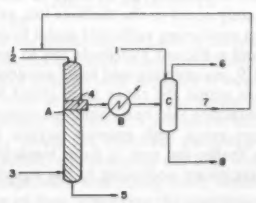
CONTINUOUS PROCESS FOR PREPARING BROMINE

Yoshihisa Ogawa; Tsunenori Inazaki, and Michihiro Kouda, all of Onoda, Japan, assignors to Nissan Chemical Industries, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 497,628, Aug. 15, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,767

Int. Cl.² C01B 7/10

U.S. Cl. 423—500 **2 Claims**



1. A continuous process for the preparation of bromine which comprises:

1. cocurrently introducing an aqueous solution of a bromide or hydrobromic acid and chlorine gas into a contact tower; said contact tower being separated into an upper packed reaction section connected to a middle section having a bromine outlet port which in turn is connected to a lower packed distillation section; said cocurrent introduction being along the axis of said reaction section; wherein the aqueous solution of a bromide or hydrobromic acid is heated to less than 80° C in said reaction section while forming bromine in said aqueous solution; and wherein at least a part of said bromine is removed from the bromine outlet port; and
2. introducing steam into the lower part of said distillation section, thereby countercurrently contacting the aqueous solution descending from step (1) with said steam to heat said aqueous solution in said distillation section to a temperature greater than 90° C, thereby distilling the remaining bromine from the bromine outlet port.

4,031,195
REGENERATIVE METHOD REMOVAL OF SULFUR DIOXIDE FROM STACK GASES

Lewis W. Elston, Atlanta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Continuation-in-part of Ser. No. 359,997, May 14, 1973, abandoned. This application Feb. 4, 1976, Ser. No. 655,167
Int. Cl.² B01D *53/34*
U.S. Cl. 423—554 **3 Claims**

1. The method of quantitative removal of sulfur dioxide from effluent gases, which comprises the steps of:
   a. contacting an aqueous medium containing essentially BaO_2 with effluent gases which contain SO_2 for a time sufficient to absorb the SO_2 and to generate an amount of H_2O_2 to convert the SO_2 to $BaSO_4$, the amount of H_2O_2 being generated in response to a demand initiated by absorption of the SO_2 so that the medium is maintained at a pH ranging from 1.0 to 6.9; and
   b. removing the $BaSO_4$ from the aqueous medium.

4,031,196
PREPARING AQUEOUS ALKALINE SLURRY OF THALLIC OXIDE

John J. Leonard, Springfield, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 579,758, May 22, 1975, abandoned. This application Aug. 24, 1976, Ser. No. 717,309
Int. Cl.² C01G *15/00*
U.S. Cl. 423—624 **2 Claims**

1. The method of preparing thallic oxide which consists of preparing a basic aqueous composition having a pH greater than 11.9, said basic aqueous composition containing at least 0.05 but not more than 3 molar thallous ion, said basic aqueous composition containing an amount of alkanoate ion at least approximately equal to the thallous ion, said basic aqueous composition containing sufficient metal hydroxide providing metal ion and sufficient hydroxide ion to provide said pH greater than 11.9, maintaining said basic aqueous composition at a temperature within the range from about 90° C to about 250° C, and contacting said basic aqueous composition within said temperature range with gaseous oxygen to oxidize the thallous ion to thallic ion and to form insoluble particles of thallic oxide precipitate according to the equation

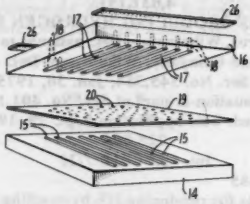
$$4\,RCO_2Tl + 3O_2 + 4M^{+} \xrightarrow{OH^{-} > 11.9} 4RCO_2M + 2\,Tl_2O_3$$

wherein R is an alkyl group having from 1 to 4 carbon atoms, M is said metal ion, and separating said particles of thallic oxide precipitate from said basic aqueous composition.

4,031,197
IN VITRO METHOD FOR DETERMINING ALLERGIC HYPERSENSITIVITY

Vincent A. Marinkovich, Palo Alto, Calif., assignor to GTE New Ventures Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 354,881, April 25, 1973, Pat. No. 3,941,876. This application July 7, 1975, Ser. No. 593,649
The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.
Int. Cl.² G01N *33/00*; A61B *10/00*
U.S. Cl. 424—1 **6 Claims**



1. The method of simultaneously determining hypersensitivity of a number of human patients to a number of allergens which comprises providing a sheet of paper coated with a water impervious material so as to leave on the paper a large number of uncoated islands so arranged that each island lies in a horizontal row of islands and also in a vertical row of islands, enclosing the sheet in a jig having liquid receiving troughs in register with each horizontal row of islands, filling each trough with a separate identified allergen to impregnate the island areas with allergen, removing the allergens from the troughs and filling the troughs with an aqueous wash liquid to wash excess allergens from the paper, removing the wash liquid from the troughs and then removing the paper from the jig, enclosing the paper in a jig having liquid receiving troughs in register with the vertical rows of islands, filling each trough with diluted blood serum of a different human patient to contact the island areas with serum, removing the serums from the troughs, filling the troughs with an aqueous wash liquid to remove unreacted serum from the island areas, removing the wash liquid from the troughs and removing the paper from the jig, immersing the paper in a solution of anti-immunoglobulin E specific antiserum labeled with a cellulose inert fluorescent material or with a cellulose inert radioactive material and identifying the island areas which contain fluorescent or radioactive material.

4,031,198
TECHNETIUM-LABELED COMPLEXES, PRODUCTION AND USE THEREOF

Richard A. Jackson, White Bear Lake, and Theodore F. Bolles, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 285,079, Aug. 30, 1972, Pat. No. 3,873,680. This application May 30, 1974, Ser. No. 474,377
Int. Cl.² G01N *23/00*; G21H *5/02*
U.S. Cl. 424—1 **2 Claims**

1. A stable radiopharmaceutical composition for preparing a biologically sterile liquid aqueous medium containing a liver specific agent labeled with technetium-99m comprising a compound for imparting liver specificity to technetium-99m selected from the group consisting of:
   N-acetyl penicillamine,
   2-mercaptoethylamine,
   2-mercaptoethanol,
   3-mercaptopropanol,
   4-mercaptobutanol,
   4-mercapto-2-methyl-2-butanol,
   2-mercaptoethylamine,
   6,8-dihydrothioctic acid,
   alpha-thio-2-furan pyruvic acid,

p-mercaptobenzoic acid, and mixtures thereof;
and a pharmaceutically-acceptable reducing agent for pertechnetate, said compound being present in an amount sufficient to provide a concentration of about 0.5 to about 1000 micromoles per milliliter in said aqueous medium; and said reducing agent being present in an amount sufficient to provide a concentration of about 0.01 to about 100 micromoles per milliliter in said aqueous medium.

4,031,199

PROCESS FOR THE PRODUCTION OF ALLERGEN-CONTAINING EXTRACTS

Otto Nieschulz, Hamburg; Günther Rüdiger, Reinbek, and Jürgen Maass, Kroeppelshagen, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Division of Ser. No. 421,791, Dec. 5, 1973, Pat. No. 3,953,588. This application Dec. 15, 1975, Ser. No. 640,546
Claims priority, application Germany, Oct. 20, 1973, 2352724; Dec. 11, 1972, 2260455
Int. Cl.² A61K *39/100*
U.S. Cl. 424—12 **6 Claims**

1. In a process for preparing an allergen extract which includes pre-extracting an allergen-containing material having a plurality of allergens, a portion of which is more lipophilic in character than the remainder, with a lipophilic solvent consisting essentially of an aqueous solution of a neutral, water-soluble cyclic ether having a boiling point below 105° C. which is at least one member selected from the group consisting of tetrahydrofuran, tetrahydropyran and dioxane to extract said lipophilic portion; extracting resultant allergen-containing material with a hydrophilic aqueous or aqueous alcoholic allergen solvent; and recovering water-soluble allergens from said material; the improvement which comprises:
sonicating said allergen-containing material to increase allergenic activity.

4,031,200

MANUFACTURE OF PHARMACEUTICAL UNIT DOSAGE FORMS

Robert Bruce Reif, Grove City, Ohio, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 15, 1975, Ser. No. 640,653
Int. Cl.² A61K *9/70*; B31F *1/00*
U.S. Cl. 424—27 **7 Claims**

1. A method of preparing solid pharmaceutical dosage forms comprising loading one or more medicaments to a therapeutically inert, edible web, fabricating same into a solid geometric form of predetermined dimensions having said medicament substantially internalized, said form being divisible into a plurality of unit dosage forms, said fabricating step comprising forming a continuous stack of a plurality of layers of web and subjecting said stack to pressure to densify and shape same into a continuous rod-like first geometric form, unitizing said geometric form into said plurality of unit dosage forms and sealing said unit dosage forms to completely internalize said medicament, said procedures including at least one non-destructive testing operation to assure uniform quality of said unit dosage forms.

4,031,201

FIBRES INCORPORATING ANTIBODIES, ANTIGENS AND ANTISERA, METHOD FOR THEIR PREPARATION AND THEIR USE

Onofrio Lostia, and Francesco Bartoli, both of Rome, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed July 29, 1975, Ser. No. 599,993
Claims priority, application Italy, July 31, 1974, 52379/74
Int. Cl.² A61K *9/70*, *39/00*, *39/12*
U.S. Cl. 424—27 **4 Claims**

1. A method for the preparation of porous fibres having microcavities containing antibody, antigen or antisera substances, and including selecting a spinning solvent and polymer which will not cause inactivation of the substances to be contained in said microcavities, comprising
preparing the antibody, antigen or antisera substance to be embedded in the fibres and verifying the aspecific fixing of the substance on the material from which the fibres are to be made, and its lack of or non-significant inactivation, by treatment with the spinning solvents that are to be used in producing the fibres,
mixing said substance with water or mixtures of glycerol and water,
adding the mixture containing the substance to said polymer in solution,
stirring until a homogeneous emulsion is obtained,
spinning the emulsion through a spinneret immersed in a coagulation bath to produce porous fibres with said substance occluded within the microcavities in said fibres, and
removing the coagulation liquor and the solvent of the polymer from the fibres by treatment thereof in a stream of air or other gas.

4,031,202

CONTROLLED RELEASE CONTRACEPTIVE ARTICLE

Robert Gene Laughlin, and Thomas William Gougeon, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 8, 1975, Ser. No. 638,775
Int. Cl.² A61M *31/00*
U.S. Cl. 424—28 **11 Claims**

1. An article of manufacture especially adapted for use as a contraceptive, comprising:
a. a stable, insoluble container, at least part of the wall of said container comprising a microporous cellulose membrane;
b. a spermicidal alkylene oxide nonionic surfactant releasably affixed to the outer surface of the article; and
c. a solution consisting essentially of:
i. a micelle-forming spermicidal alkylene oxide nonionic surfactant compound, and
ii. a solvent for said surfactant compound, comprising water,
said solution having a concentration above the critical micelle concentration of the surfactant compound, said solution being enclosed within the container.

4,031,203

HEPATITIS A ANTIGEN

Philip J. Provost, Harleysville; Oswald L. Ittensohn, Telford, and Maurice R. Hilleman, Lafayette Hill, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 530,623, Dec. 9, 1974. This application June 7, 1976, Ser. No. 693,668
Int. Cl.² A61K *39/12*
U.S. Cl. 424—89 **3 Claims**

1. A method for obtaining hepatitis A antigen in an amount effective to complex hepatitis A antibody comprising inoculating a non-human primate with hepatitis A virus, subsequently removing the liver at a time when the serum glutamic oxaloacetic transaminase enzyme and the serum isocitric dehydrogenase enzyme levels are elevated, perfusing the liver with physiological saline, comminuting the liver and adding saline to obtain a suspension containing from about 5% to about 25% by weight of liver, clarifying the suspension, treating the suspension with CsCl gradient and selecting material having a buoyant density of from about 1.32 g/cm³ to about 1.36 g/cm³ of CsCl.

4,031,204
FELINE VIRAL RHINOTRACHEITIS VACCINE AND COMBINATION FELINE VIRAL RHINOTRACHEITIS-CALICIVIRUS VACCINE PREPARED THEREFROM

Eldon Davis, Lincoln, Nebr., assignor to Norden Laboratories, Inc., Lincoln, Nebr.

Filed Mar. 30, 1976, Ser. No. 671,792
Int. Cl.² A61K *41/00, 39/12;* C12K *7/00*
U.S. Cl. 424—90 **28 Claims**

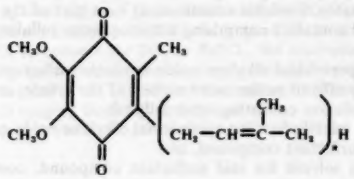
1. A modified live feline viral rhinotracheitis vaccine capable of inducing immunity in animals of the genus felidae without serious side effects comprising a modified live feline viral rhinotracheitis virus prepared by treating a feline viral rhinotracheitis virus which has been chemically modified by treatment with DNA inhibitor(s) so that said virus grows well at 30° C ± 2° C but not at 39° C with ultraviolet light until from about 90% to about 99% of the virus particles are killed, and a carrier therefor.

4,031,205
METHOD FOR TREATING NERVOUS BLADDER

Toji Konishi, Tokyo, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1975, Ser. No. 645,912
Int. Cl.² A61K *37/48*
U.S. Cl. 424—94 **5 Claims**

1. A method for treating nervous bladder which comprises administering to a human suffering from nervous bladder an amount therapeutically effective for the treatment of nervous bladder of Ubiquinone *n* represented by the formula



wherein *n* represents one of the integer 9 or 10.

4,031,206
ANTIBIOTICS PRODUCED BY SPECIES OF PSEUDONOCARDIA

Walter D. Celmer, New London; Walter P. Cullen, East Lyme; Charles E. Moppett, Mystic; John B. Routien, Lyme, all of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Feb. 4, 1976, Ser. No. 655,075
Int. Cl.² A61K *35/70*
U.S. Cl. 424—117 **3 Claims**

2. Antibiotic substance Compound 41,043 which is soluble in acetone, chloroform, methylisobutyl ketone, ethyl acetate, ethanol dimethyl sulfoxide or dimethylformamide; insoluble in hexane, heptane, water or diethyl ether; has absorption maxima in ethanol in the ultraviolet light region of the spectrum at 225, 270, 300 and 350 nm with $E_{1\ cm}^{1\%}$ values of 444, 217, 183 and 91, respectively; has the average composition by weight of 50.10% carbon, 4.88% hydrogen, 9.15% nitrogen, 8.40% sulfur and 27.50% oxygen (by difference); has an optical roration of α_D + 77° (c = 1.0, acetone); and when pelleted in KBr exhibits characteristic absorption in the infrared region at the following wavelengths in microns: 3.00, 3.45, 5.72, 5.80, 5.90, 6.00, 6.45, 6.52, 7.22, 7.60, 8.00, 8.30, 8.60, 8.95, 9.35, 9.98, 10.15, 11.00, 12.68 and 13.35.

4,031,207
ANTIBIOTIC

Klaus Bauer; Werner Frommer; Wilfried Kaufmann; Georg Metzger; Martin Scheer; Delf Schmidt; Theo Schroder, all of Wuppertal, and Dietmar Schafer, Marburg, Lahn, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 26, 1976, Ser. No. 661,545
Claims priority, application Germany, Mar. 8, 1975, 2510161
Int. Cl.² A61K *35/74*
U.S. Cl. 424—118 **9 Claims**

1. An antibiotic characterized by being a neutral solid which does not migrate upon electrophoresis; contains carbon, hydrogen and oxygen in the weight ratio of carbon to hydrogen to oxygen of 50.8:7.2:42 respectively; is soluble in water, lower alcohols, chloroform and acetone and sparingly soluble in diethyl ether, petroleum ether and cyclohexane; is optically active with the specific rotation value $[\alpha]_D^{20}$ measured as a 1% solution in methanol being −32.97°; has a pronounced UV absorption band at 267 mm with an $E^{1\%}$/cm of 164; and exhibits characteristic absorption at the following infrared frequencies expressed in reciprocal centimeters: 3440, 2960, 2920, 2850, 1630, 1570, 1445, 1405, 1375, 1310 (weak), 1290 (weak), 1200, 1060, 1020, 895, 940, 905, 780 and 750.

4,031,208
ANTIBIOTIC

Klaus Bauer; Werner Frommer; Wilfried Kaufmann; Karl Georg Metzger; Martin Scheer; Delf Schmidt; Theo Schröder, all of Wuppertal, and Dietmar Schäfer, Marburg an der Lahn, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 26, 1976, Ser. No. 661,544
Claims priority, application Germany, Mar. 8, 1975, 2510160
Int. Cl.² A61K *35/74*
U.S. Cl. 424—119 **9 Claims**

1. An antibiotic characterized by being a neutral solid which does not migrate upon electrophoresis; contains carbon, hydrogen and oxygen substantially in the weight % ratio of carbon to hydrogen to oxygen of 56.19:6.54:37.25 respectively; starts to decompose upon heating slightly above about 142° C and decomposes rapidly above 177° C; is readily soluble in chloroform, acetone, ethyl acetate, acetonitrile, dimethylformamide, dimethylsulfoxide, methanol and ethanol and less soluble in water, diethyl ether, petroleum ether and cyclohexane; is optically active with the specific rotation value $[\alpha]_D^{20}$ measured as a 1% solution in methanol being −6.6°; has a pronounced UV absorption band at 307 nm with an $E^{1\%}$/cm of 351; and exhibits characteristic absorption at the following infrared frequencies expressed in reciprocal centimeters: 3450, 2980, 2940, 2900, 1710, 1615, 1450, 1415, 1375, 1310, 1290, 1255, 1215, 1195, 1130, 1040, 945, 905, 870, 840, 820, 785, 750 735 and 700.

4,031,209
AQUEOUS SOLUTION SUITABLE FOR DISSIPATING AVAILABLE IODINE CONTAINED IN AN IODOPHOR

Joseph Zenon Krezanoski, Los Altos, Calif., assignor to Flow Pharmaceuticals, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 315,793, Dec. 18, 1972, Pat. No. 3,911,107. This application June 2, 1975, Ser. No. 582,762
The portion of the term of this patent subsequent to Oct. 7, 1992, has been disclaimed.
Int. Cl.² A01N *11/00;* A61K *33/18*
U.S. Cl. 424—150 **19 Claims**

1. A sterile aqueous solution suitable for dissipating available iodine contained in an iodophor at a controlled rate, consisting essentially of:

a. from about 0.01% to about 5% by weight sorbic acid or a soluble salt thereof; and

b. from about 0.01% to about 5% by weight ethylenediaminetetraacetic acid or a soluble salt thereof.

4,031,210

ANTIBIOTIC AMINOGLYCOSIDES, PROCESSES OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS

Jean-Bernard Chazan, Paris, and Jean-Claude Gasc, Bondy, both of France, assignors to Roussel-UCLAF, Paris, France

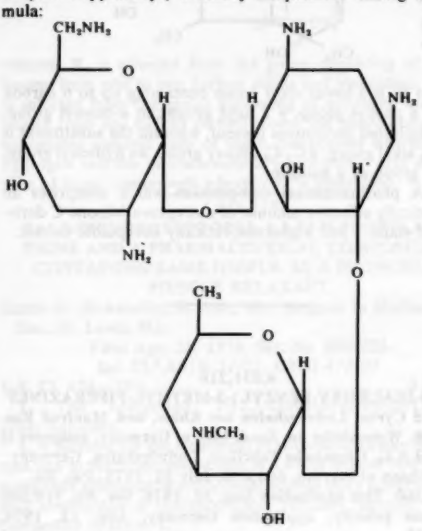
Filed Nov. 11, 1975, Ser. No. 630,917

Claims priority, application France, Nov. 13, 1974, 74.37374

Int. Cl.² C07H *15/22*; A61K *31/71*

U.S. Cl. 424—180 **9 Claims**

1. The 4-0-[2',6'-diamino 2', 3', 6'-tridesoxy α, D-ribohexopyranosyl] 6-0-[3''-methylamino 3'', 4'', 6''-tridesoxy α, D-xylohexopyranosyl] 2-desoxy streptamine having the formula:



(I

and its pharmaceutically acceptable salts.

8. A method for treating bacteria infections in humans and animals comprising administering to humans and animals a therapeutically effective amount of the compound of formula I as claimed in claim 1 or one of its therapeutically compatible salts

---

4,031,211

ADRIAMYCIN ESTERS, THEIR PREPARATION AND USE

Bianca Patelli; Luigi Bernardi, both of Milan; Federico Arcamone, Nerviano (Milan), and Aurelio di Marco, Milan, all of Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

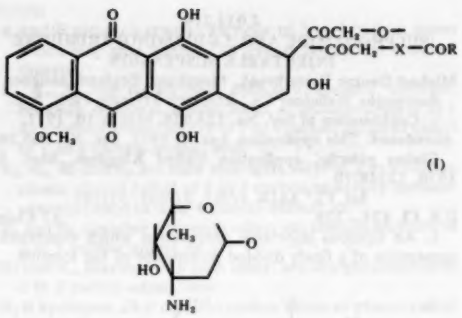
Filed June 10, 1976, Ser. No. 694,656

Claims priority, application United Kingdom, June 20, 1975, 26271/75

Int. Cl.² A61K *31/70*; C07H *15/24*

U.S. Cl. 424—180 **8 Claims**

1. An adriamycin ester of the formula (I):



(I)

wherein X is O, S or NH and R is a straight chain alkyl having from 5 to 20 carbon atoms and the hydrochlorides thereof.

7. A method for inhibiting the growth of a tumor selected from the group consisting of ascites sarcoma 180, L 1210 leukemia, gross leukemia, solid sarcoma 180 comprising intravenously or intraperitoneally administering to a host afflicted with said tumor an amount of a compound according to claim 1, sufficient to inhibit the growth of said tumor.

4,031,212

3β-(4-OXO-α-L-RHAMNOSYL)-β-HYDROXY-BUFA-4,20,22-TRIENOLIDE

Walter Lösel, Ingelheim am Rhein; Werner Traunecker, Munster-Sarmsheim, and Wolfgang Hoefke, Budenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed July 30, 1975, Ser. No. 600,500

Claims priority, application Germany, Aug. 5, 1974, 2437612

Int. Cl.² A61K *31/58*

U.S. Cl. 424—182 **3 Claims**

1. 3β-(4'-Oxo-α-L-rhamnosyl)-14β-hydroxy-bufa-4,20,22-trienolide.

2. A cardiotonic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective cardiotonic amount of the compound of claim 1.

4,031,213

PHARMACEUTICAL COMPOSITION AND METHOD FOR THE TREATMENT OF HYDROPIC CONDITIONS

Rolf Kuhn, Mannheim-Waldhof; Klaus Hardebeck, Ludwigshafen (Rhine), and Helmut Heinemann, Heidelberg, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Filed Apr. 16, 1975, Ser. No. 568,640

Claims priority, application Germany, May 15, 1974, 2423606

Int. Cl.² A61L *13/00*

U.S. Cl. 424—229 **12 Claims**

1. Pharmaceutical composition for treating hydropic conditions comprising

a. 10 to 100 parts by weight of at least one member of 5-(4-chloro-5-sulfamoyl-2-thenylaminophenyl)-tetrazole and the parmacologically compatible salts thereof,

b. 50 parts by weight of 3-(3-oxo-7α-acethylthio-17β-hydroxy-4-androsten-17α-yl)-propionic acid-γ-lactone, and

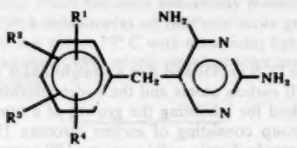
c. a pharmaceutical diluent or carrier.

4,031,214
SULPHONAMIDE AND 2,4-DIAMINOPYRIMIDINE INJECTABLE SUSPENSION

Michael George Easterbrook, Meopham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 123,079, March 10, 1971, abandoned. This application Apr. 7, 1975, Ser. No. 565,964
Claims priority, application United Kingdom, Mar. 13, 1970, 12348/70
Int. Cl.² A61K *31/63, 31/635, 31/505*
U.S. Cl. 424—229 **17 Claims**

1. An aqueous injectable preparation which comprises a suspension of a finely divided potentiator of the formula



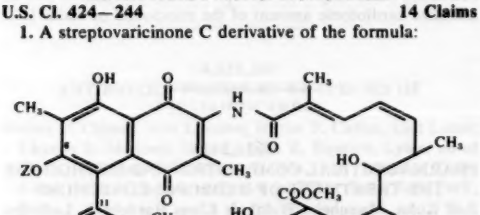
wherein R^1, R^2, R^3 and R^4 are the same or different and can each be a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group or a benzyloxy group or, when R^1, and R^2 are each hydrogen atoms, R^3 and R^4 taken together can be a methylene dioxy group substantially all of the particles of potentiator in the suspension having a largest dimension less than 50μm, in an aqueous solution of a pharmaceutically acceptable water soluble salt of a sulphonamide with a strong base, and wherein the pH of the preparation is in the range of from 9.75 to 12.0.

4,031,215
STREPTOVARICINONE C DERIVATIVES AS ANTIBIOTICS

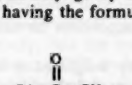
Kazuya Sasaki, Higashikurume; Takanobu Naito, Funabashi; Yoshio Momoki, Tokyo; Toshio Sega, Tokyo, and Toshiyuki Satomi, Tokyo, all of Japan, assignors to Kaken Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,843
Claims priority, application Japan, Nov. 11, 1974, 49-128967; Nov. 12, 1974, 49-129523; Feb. 18, 1975, 50-19470; Mar. 20, 1975, 50-32953
Int. Cl.² C07D *491/14, 491/18, 491/22*
U.S. Cl. 424—244 **14 Claims**

1. A streptovaricinone C derivative of the formula:

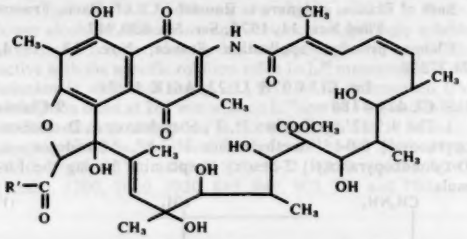


wherein Z is alkyl, a phenyl or a phenyl substituted by a halogen, an alkoxy group, an alkyl group or NO_2, a hydroxyalkyl, an alkenyl, a ketonyl having the formula



wherein R' is a lower alkyl group containing up to 6 carbon atoms, a phenyl group, a 2-furyl group, an α-thienyl group, and substituted derivatives thereof, wherein the substituent is a C_1-C_6 alkyl group, a C_1-C_6 alkoxy group, an hydroxyl group, a nitro group or a halogen, a furyl-oxoalkyl, a thienyl-oxoalkyl, a phenacyl, a carbamylalkyl, a benzyl, a phenoxyadkyl, a cyanoalkyl, a phenethyl, a benzoyloxyethyl, a p-chlorophenacyl, a p-methoxyphenacyl, a p-nitrobenzyl, a p-methylbenzyl, an alkanoyl, a benzoyl, a benzenesulfonyl, an alkylsulfonyl or an alkoxy-carbonyl group wherein alkyl, alkoxy, alkenyl, alkanoyl and alkoxycarbonyl have 1-12 carbon atoms unless otherwise specified.

7. An aldol condensation product of the streptovaricinone C derivative of claim 1 having the formula:



wherein R' is a lower alkyl group containing up to 6 carbon atoms, a phenyl group, a 2-furyl group, an α-thienyl group, and substituted derivatives thereof, wherein the substituent is a C_1-C_6 alkyl group, a C_1-C_6 alkoxy group, an hydroxyl group, a nitro group or a halogen.

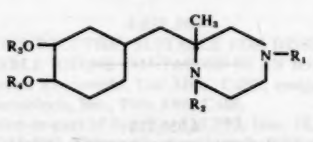
11. A pharmaceutical composition which comprises an antibiotically effective amount of a streptovaricinone C derivative of claim 1 and a pharmaceutically acceptable carrier.

4,031,216
3-(3,4-DIALKOXY-BENZYL)-3-METHYL-PIPERAZINES

Richard Cyrus, Ludwigshafen am Rhine, and Manfred Raschack, Weisenheim am Sand, both of Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen, Germany

Division of Ser. No. 600,870, July 31, 1975, Pat. No. 3,996,360. This application Aug. 31, 1976, Ser. No. 719,105
Claims priority, application Germany, Aug. 12, 1974, 2438725
Int. Cl.² C07D *241/04, 241/06;* **A61K** *31/495*
U.S. Cl. 424—250 **9 Claims**

1. A piperazine compound of the formula



and salts thereof with a physiologically tolerable acid, wherein R_1 is hydrogen; R_2 is hydrogen, straight chain alkyl having 1 – 5 carbon atoms, alkenyl having 3 to 4 carbon atoms, or hydroxyalkyl having 2 – 4 carbon atoms; and R_3 and R_4, which are the same or different, are alkyl having 1 – 4 carbon atoms.

8. A therapeutic composition for treating cardiac disease consisting essentially of a pharmaceutical excipient and an effective amount of a piperazine compound as in claim 1, or of a salt thereof with a therapeutically tolerable acid, as the active ingredient.

4,031,217

1-OXO-1H-6-SUBSTITUTED-PYRIMIDO(1,2-a)-QUINOLINE-2-CARBOXYLIC ACIDS AND ESTERS USEFUL AS ANTIULCER AGENTS

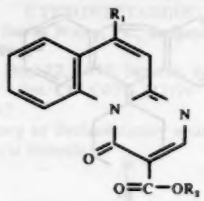
Saul B. Kadin, and Peter F. Moore, both of New London, Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 594,766, July 10, 1975. This application Aug. 10, 1976, Ser. No. 713,145

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 7 Claims

1. A method for the control of gastric ulcers in mammalian subjects which comprises administering to the subjects an effective antiulcer amount of a compound having the formula



wherein R_1 is selected from the group consisting of alkoxy having from one to two carbon atoms and piperidino; and R_2 is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms; the pharmaceutically-acceptable cationic salts of those compounds wherein R_2 is hydrogen and the pharmaceutically-acceptable acid addition salts of those compounds wherein R_1 is piperidino.

4,031,218

7-(2,3-DIHYDROXYPROPYL-1,3-DI-N-PROPYLXANTHINE AND A PHARMACEUTICAL COMPOSITION CONTAINING SAME USEFUL AS A BRONCHIAL MUSCLE RELAXANT

Samir M. El-Antably, St. Ann, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Apr. 28, 1976, Ser. No. 680,936

Int. Cl.² A61K *31/52;* C07D *473/04*

U.S. Cl. 424—253 3 Claims

1. The compound 7-(2,3-dihydroxypropyl)-1,3-di-n-propylxanthine.

2. A method for the treatment of reversible airway obstruction due to bronchoconstriction in a living animal body which comprises administering to a living animal body suffering from said obstruction a therapeutically effective amount of the compound of claim 1.

3. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a therapeutically effective bronchodilater amount of the compound of claim 1.

4,031,219

BIS-HOMOPHTHALIMIDES AND SALTS THEREOF

Eberhard Kutter; Volkhard Austel; Wolfgang Eberlein, all of Biberach; Joachim Heider, Warthausen, all of Germany; Walter Kobinger; Christian Lillie, both of Vienna, Austria, and Rudolf Kadatz, Biberach, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

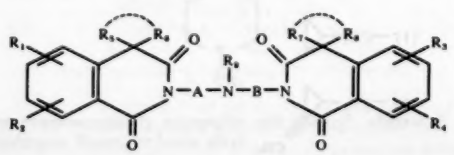
Filed July 13, 1976, Ser. No. 704,844

Claims priority, application Germany, July 30, 1975, 2533986; May 21, 1976, 2622690

Int. Cl.² C07D *217/24;* A61K *31/47*

U.S. Cl. 424—258 10 Claims

1. A compound of the formula



wherein

A and B are each straight alkylene of 2 to 4 carbon atoms which may have a methyl or phenyl substituent attached thereto,

R_1, R_2, R_3 and R_4 are each hydrogen, fluorine, chlorine, bromine, hydroxyl, amino, nitro, acetylamino, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms or (alkyl of 1 to 3 carbon atoms) thio,

R_5, R_6, R_7 and R_8 are each hydrogen, alkyl of 1 to 4 carbon atoms, phenyl-(alkyl of 1 to 4 carbon atoms) or methoxyphenyl-(alkyl of 1 to 4 carbon atoms), or

R_5 and R_6, together with each other, are straight alkylene of 2 to 5 carbon atoms, or

R_7 and R_8, together with each other, are straight alkylene of 2 to 5 carbon atoms, and

R_9 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl-(alkyl of 1 to 6 carbon atoms),

or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

9. An antiarrhythmic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antiarrhythmic amount of a compound of claim 1.

10. The method of preventing or alleviating cardiac arrythmia in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective antiarrhythmic amount of a compound of claim 1.

4,031,220

METHOD FOR THE TREATMENT OF MALARIA

William Henry George Richards, Orpington, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Aug. 20, 1975, Ser. No. 606,004

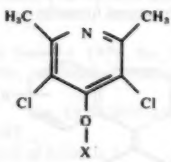
Claims priority, application United Kingdom, Aug. 20, 1974, 36523/74

Int. Cl.² A61K *31/47, 31/44*

U.S. Cl. 424—258 9 Claims

1. A method for the treatment or prophylaxis of malaria in a mammal which might be exposed to malaria or suffering from malaria which comprises the administration to the mammal of a non-toxic, effective antimalarial treatment or prophylaxis amount of the formulation comprising:

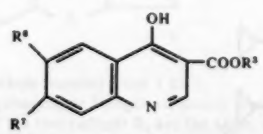
(a) a compound of the formula (I)



(I)

wherein X is hydrogen, an alkali metal, the ammonium radical or a group $H(CH_2)_n.CO-$ where n is an integer from 0 to 3, or a pharmaceutically and pharmacologically acceptable acid addition salt thereof when X is hydrogen; and

b. a compound of formula II



(II)

wherein R^6 is n-decyloxy, R^7 is ethoxy and R^3 is ethyl or a pharmaceutically and pharmacologically acceptable acid addition salt thereof.

4,031,221

METHOD OF TREATING PAIN AND HYPERTENSION

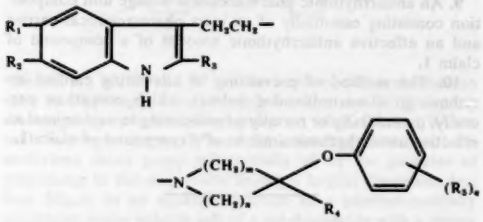
Grover C. Helsley, Pottersville, and Joseph Strupczewski, Piscataway, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 480,205, June 17, 1974, abandoned. This application June 19, 1975, Ser. No. 588,135

Int. Cl.² A61K *31/33, 31/40, 31/445*

U.S. Cl. 424—267 **36 Claims**

1. A method of treating pain and reducing blood pressure which comprises administering to a patient in pain or having elevated blood pressure an effective amount of a compound of the formula:



in which R_1 and R_2 are hydrogen, halogen, alkyl of from 1 to 2 carbon atoms, alkoxy of from 1 to 2 carbon atoms or phenalkoxy of from 7 to 9 carbon atoms; R_3 is hydrogen or alkyl of from 1 to 3 carbon atoms; R_4 is hydrogen or phenyl; R_5 is halogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 2 carbon atoms, nitro or trifluoromethyl; *m* is an integer from 1 to 3; *n* is 1 or 2; and *q* is 0, 1 or 2; or a physiologically tolerable acid addition salt thereof.

4,031,222

TRIFLUOROMETHYLTHIO (AND SULFONYL) DERIVATIVES OF CYPROHEPTADINE ANALOGS

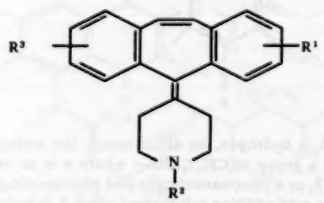
David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 22, 1975, Ser. No. 642,863

Int. Cl.² C07D *211/70*

U.S. Cl. 424—267 **15 Claims**

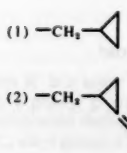
1. A compound of structural formula:



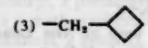
or a pharmaceutically acceptable salt thereof, wherein

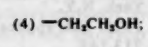
R^1 is $-SCF_3$ or SO_2CF_3,

R^2 is



-continued

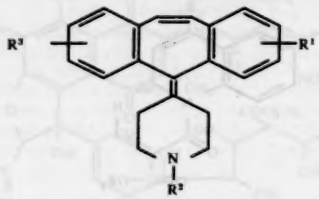




and

R^3 is hydrogen, C_{1-3} alkyl or fluoro.

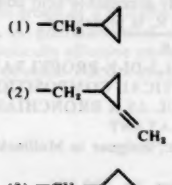
11. A method of treating psychoses which comprises the administration to a patient in need of such treatment an effective amount of a compound of structural formula:



or pharmaceutically acceptable salt thereof, wherein

R^1 is $-SCF_3$ or SO_2CF_3;

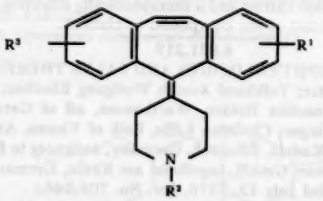
R^2 is



and

R^3 is hydrogen, C_{1-3} alkyl or fluoro.

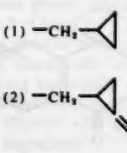
13. A pharmaceutical composition in unit dosage form for the treatment of psychoses comprising a carrier and an effective amount of a compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein

R^1 is $-SCF_3$ or SO_2CF_3,

R^2 is



-continued

(3) $-CH_2-$, or

(4) $-CH_2CH_2OH$;

and

R^3 is hydrogen, C_{1-3} alkyl or fluoro.

4,031,223

TRIFLUOROMETHYLTHIO DERIVATIVES OF CYPROHEPTADINE

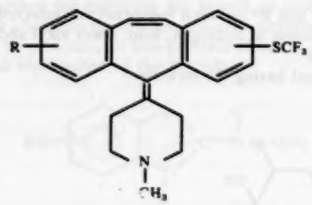
David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 22, 1975, Ser. No. 642,864

Int. Cl.² C07D *211/70*

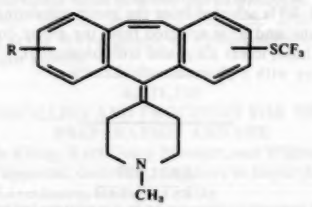
U.S. Cl. 424—267 **9 Claims**

1. A levorotatory or dextrorotatory enantiomer of a compound of structural formula:



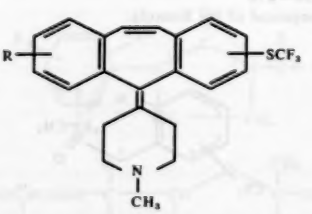
or pharmaceutically acceptable salt thereof, wherein R is hydrogen, fluoro or lower alkyl.

4. A method of treating psychoses which comprises the administration to a patient in need of such treatment an effective amount of a compound of formula:



or pharmaceutically acceptable salt thereof wherein R is hydrogen, fluoro, or lower alkyl.

6. A method of treating thrombosis which comprises the administration, to a patient in need of such treatment, an effective amount of a compound of formula:



or pharmaceutically acceptable salt thereof, wherein R is hydrogen, fluoro, or lower alkyl.

4,031,224

1,3-DIHYDRO-HETEROARYLSPIRO (ISOBENZOFURAN)S

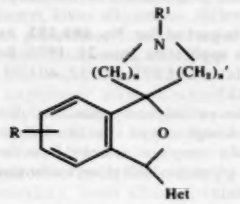
Lawrence Leo Martin, Lebanon, and Brian J. Duffy, Flanders, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Apr. 29, 1976, Ser. No. 681,509

Int. Cl.² C07D *405/14*

U.S. Cl. 424—267 **35 Claims**

1. A compound of the formula



wherein R is hydrogen, alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms, trifluoromethyl or halogen; R^1 is hydrogen, alkyl of from 1 to 6 carbon atoms, phenalkyl of from 7 to 9 carbon atoms, benzoylalkyl of the formula $-(CH_2)_m-COPhR$, phenoxy carbonyl, alkoxycarbonyl of from 2 to 7 carbon atoms, alkenyl of from 2 to 6 carbon atoms, cycloalkylcarbonyl of from 4 to 7 carbon atoms or cycloalkylalkyl of from 3 to 6 carbon atoms; Het is thienyl, pyridyl, furyl, thiazolyl, pyrryl, oxazolyl, imidazolyl or pyrazinyl; *n* and *n'* are integers from 1 to 3, the sum of which is equal to 3, 4 or 5; and *m* is an integer from 1 to 3; or an optical antipode or a pharmaceutically acceptable acid addition salt thereof.

22. A method of treating depression which comprises administering to a patient in need of such treatment a pharmaceutically effective amount of a compound as defined in claim **1.**

31. A pharmaceutical composition which comprises between about 0.5 and about 70 percent by weight of a compound defined in claim **1** as an essential active ingredient, the balance being a pharmaceutically acceptable carrier therefor.

4,031,225

4H-BENZO[4,5]CYCLOHEPTA[1,2-b]THIOPHENES

Jean-Michel Bastian, Therwil, and Richard Berthold, Bottmingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

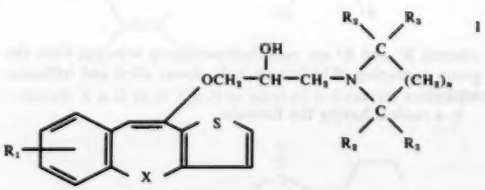
Filed June 14, 1976, Ser. No. 695,384

Claims priority, application Switzerland, June 18, 1975, 7922/75

Int. Cl.² C07D *409/12*

U.S. Cl. 424—267 **9 Claims**

1. A compound of formula I,



wherein

n is a whole number from 1 to 3,

R_1 is hydrogen, or halogen of atomic number from 9 to 35,

each of the two radicals R_2 are the same, and each is hydrogen or alkyl of 1 or 4 carbon atoms,

each of the two radicals R_3 are the same, and each is hydrogen or alkyl of 1 to 4 carbon atoms, and

X is carbonyl or methylene,

in the form of the free base or in the form of a pharmaceutically acceptable acid addition salt thereof.

4,031,226

N-[(1-PIPERIDINYL)ALKYL]ARYLCARBOXAMIDE DERIVATIVES

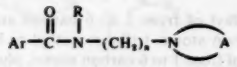
Willem Soudijn; Ineke van Wijngaarden, both of Oud-Turnhout, and Paul Adriaan Jan Janssen, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 604,282, Aug. 13, 1975, abandoned. This application June 21, 1976, Ser. No. 697,813

Int. Cl.² C07D *211/52, 401/04*

U.S. Cl. 424—267 **16 Claims**

10. A pharmaceutical composition in dosage unit form comprising per dosage unit an effective antiemetic or psychotropic amount of a compound selected from the group consisting of a N-[(1-piperidinyl)alkyl]arylcarboxamide derivative having the formula:

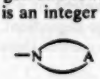


and the pharmaceutically acceptable acid salts thereof, wherein:

Ar is an aryl radical selected from the group consisting of phenyl, substituted phenyl, 2-thienyl, 2-furanyl, pyridinyl and 1-methyl-2-pyrrolyl, wherein said substituted phenyl is phenyl having from 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl, nitro, hydroxy, amino, lower alkylcarbonyloxy and lower alkylcarbonylamino, provided that when more than 1 of said substituents are present only one thereof may be selected from the group consisting of hydroxy, amino, lower alkylcarbonyloxy and lower alkylcarbonylamino;

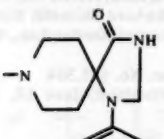
R is a member selected from the group consisting of hydrogen and lower alkyl;

n is an integer of from 2 to 3 inclusive; and



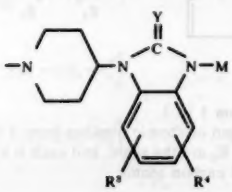
is a member selected from the group consisting of

a. a radical having the formula:



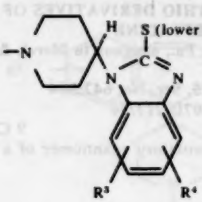
wherein R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

b. a radical having the formula:



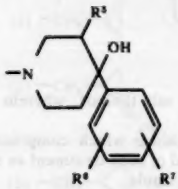
wherein R^3 and R^4 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; M is selected from the group consisting of hydrogen, lower alkyl, lower alkylcarbonyl and 2-cyanoethyl; Y is selected from the group consisting of O, S and lower alkylcarbonylimino; and the dotted line indicates that the double bond between the 3- and 4-carbon atoms of the piperidine nucleus is optional, provided that when there is a double bond between said 3- and 4-carbon atoms, then said Y is O and said M is hydrogen;

c. a radical having the formula:



wherein R^3 and R^4 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; and

d. a radical having the formula:



wherein R^5 is selected from the group consisting of hydrogen and methyl; R^6 is selected from the group consisting of hydrogen and halo; and R^7 is selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

in admixture with a pharmaceutical carrier.

4,031,227

SUBSTITUTED 2H,3H-2,1-BENZISOTHIAZOLE-S-OXIDES, METHOD OF USE AND PHARMACEUTICAL COMPOSITIONS THEREOF

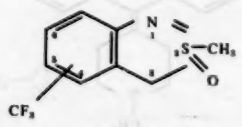
Thomas E. Jackson, Madison, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Sept. 18, 1975, Ser. No. 614,380

Int. Cl.² C07D *275/06*

U.S. Cl. 424—270 **19 Claims**

1. A compound of the formula:



wherein the CF_3 group is in the 4-, 5- or 6-position.

4. A pharmaceutical composition for inducing sleep in mammals comprising an inert pharmaceutically acceptable

carrier and a sleep-inducing effective amount of a compound of claim 1.

12. A method of inducing sleep in mammals comprising orally or parenterally administering to a mammal prior to sleep a sleep-inducing effective amount of a compound of claim 1.

16. A method of effecting tranquilization in mammals comprising orally or parenterally administering to a mammal in need of such treatment a tranquilizing-effective amount of a compound of claim 1.

4,031,228
5(6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATIVES HAVING ANTI-PROTOZOAL ACTIVITY

Colin C. Beard, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

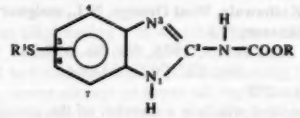
Continuation-in-part of Ser. No. 566,014, April 7, 1975, Pat. No. 3,962,437, which is a division of Ser. No. 371,365, June 19, 1973, Pat. No. 3,901,901. This application Mar. 22, 1976, Ser. No. 669,373

The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.² A61K *31/425, 31/54*

U.S. Cl. 424—270 **18 Claims**

1. A method for inhibiting the growth of protozoa which comprises administering to a host object containing or subject to attach by protozoa, an anti-protozoal effective amount of a compound represented by the formula:



where R is a lower alkyl group having 1 to 4 carbon atoms; R^1 is a fused, bicyclic heterocyclic ring moiety having 5 or 6 atoms in each ring, the rings having 2 common atoms one of which is a nitrogen atom, and the other of which is a carbon atom, the carbon atom being covalently bonded to the nitrogen atom, a hetero sulfur atom in each ring and the sulfur atom between the heterocyclic ring moiety and the benzimidazole nucleus; the R^1S-substitution being at the 5(6)-position; or a pharmaceutically acceptable salt thereof.

4,031,229
PENICILLINS AND PROCESSES FOR THEIR PREPARATION AND USE

Hans-Bodo König; Karl Georg Metzger, and Wilfried Schröck, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

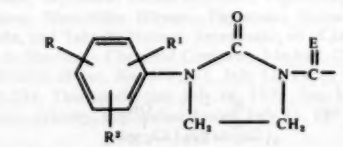
Filed June 4, 1976, Ser. No. 692,930

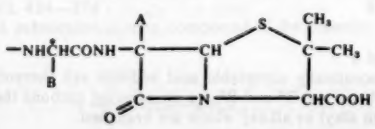
Claims priority, application Germany, June 24, 1975, 2528079

Int. Cl.² A61K *31/43*; C07D *499/66, 499/68, 499/70*

U.S. Cl. 424—271 **15 Claims**

1. A compound selected from the group consisting of a penicillin of the formula:





and the pharmaceutically acceptable salts thereof, wherein

the carbon atom designated * constitutes a center of chirality;

A is hydrogen or methoxy;

B is phenyl, hydroxyphenyl, halophenyl, methoxyphenyl, cyanophenyl, methylsulfonylphenyl, thienyl, cyclohexenyl or cyclohexa-1,4-dien-1-yl;

each of R, R^1 and R^2 is independently selected from the group consisting of hydrogen, halo, lower alkyl, halo(lower)alkyl, carboxy, formyl, carbo(lower alkoxy), lower alkanoyl, cyano, carbamyl, lower alkylcarbamyl, di(lower alkyl)carbamyl, lower alkylamino, di(lower alkyl)amino, pyrrolidino, piperidino, formamido, lower alkanamido, N-(lower alkyl)formamido, N-(lower alkyl)lower alkanamido, lower alkylidenimino, lower alkylsulfonamido, n-(lower alkyl)lower alkylsulfonamido, sulfamino, N-(lower alkyl)sulfamino, amidino, di(lower alkyl-)aminomethylidenimino, pyrrolidinomethylidenimino, guanido, nitro, azido, carbo(lower alkoxy)amino, N-(lower alkyl)carbo(lower alkoxy)-amino, hydroxy, lower alkoxy, formyloxy, lower alkanoyloxy, lower alkoxycarbonyloxy, carbamyloxy, N-(lower alkyl)carbamyloxy, N,N-di(lower alkyl)-carbamyloxy, pyrrolidinocarboxyloxy, sulfamyl, N-(lower alkyl)sulfamyloxy, N,N-di(-lower alkyl)-sulfamyloxy, mercapto, lower alkylthio, trifluoromethylthio, lower alkylsulfonyl, sulfo, lower alkylsulfinyl, trifluoromethylsulfonyl, sulfamyl, N-(lower alkyl)sulfamyl, N,N-di(lower alkyl)sulfamyl, pyrrolidinosulfonyl, and sulfothio; and

E is oxygen or sulfur.

4,031,230
NOVEL PENICILLINS AND THEIR PREPARATION

Rudolf Gottschlich; Werner Rogalski; Rolf Bergmann; Rosmarie Steinigeweg, and Helmut Wahlig, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

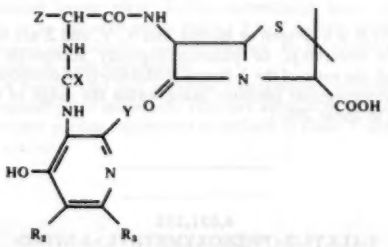
Filed Oct. 22, 1975, Ser. No. 624,763

Claims priority, application Germany, Aug. 9, 1975, 2535655; Oct. 25, 1974, 2450668

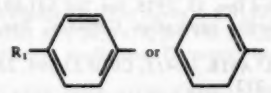
Int. Cl.² C07D *499/68*; A61K *31/43*

U.S. Cl. 424—271 **100 Claims**

1. A penicillin of the formula



wherein X is O or S; Y is H or alkyl of 1–4 carbon atoms; Z is



and R_1 is H or OH; and R_2 and R_3 each are H or collectively

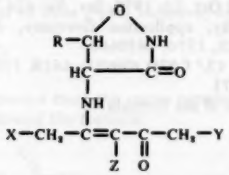
with the carbons to which they are attached form a first benzene or pyridine ring which is unsubstituted, which is substituted by up to two of alkyl, alkoxy of 1–4 carbon atoms, dialkylamino or halogen, wherein alkyl and alkoxy in each instance are of 1–4 carbon atoms, or which is fused at two adjacent carbons thereof directly to a second benzene or pyridine ring; or a conventional penicillin in vivo hydrolyzable and physiologically acceptable ester thereof; or physiologically acceptable salt of either.

4,031,231
ANTIBACTERIAL COMPOSITION COMPRISING 3-FLUORO-D-ALANINE OR DEUTERO ANALOG IN COMBINATION WITH AUTO-ANTAGONIST INHIBITOR

Frederick M. Kahan, Rahway, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 478,793, June 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 387,571, Aug. 10, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 314,878, Dec. 13, 1972, abandoned, and Ser. No. 223,360, Feb. 3, 1972, abandoned.
This application Jan. 23, 1976, Ser. No. 651,878
Int. Cl.[2] A61U *31/42, 31/195*
U.S. Cl. 424—272 **15 Claims**

1. An antibacterial composition comprising as active ingredients a combination of 3-fluoro-D-alanine-type compound and 3-fluoro-D-alanine autoantagonist-inhibitor characterized in that the 3-fluoro-D-alanine-type compound is selected from the group consisting of 3-fluoro-D-alanine, 2-deutero-3-fluoro-D-alanine, 2,3-dideutero-3-fluoro-D-alanine, 2,3,3-trideutero-3-fluoro-D-alanine, and their lower alkyl ester or pharmacologically acceptable salt thereof; and the 3-fluoro-D-alanine autoantagonist inhibitor is cycloserine, terizidone, cis-cyclothreonine, transcyclothreonine or an N-substituted cycloserine compound having the formula



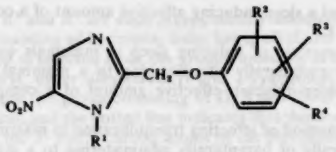
wherein R is hydrogen or methyl, and X, Y, and Z are hydrogen or loweralkyl, or pharmacologically acceptable salts thereof, the ratio of the 3-fluoro-D-alanine-type compound to the autoantagonist inhibitor being within the range of about 1:120 to about 200:1.

4,031,232
1-ALKYL-2-(PHENOXYMETHYL)-5-NITRO-IMIDAZOLES AND PROCESS FOR THEIR MANUFACTURE

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 15, 1975, Ser. No. 641,091
Claims priority, application Germany, Dec. 16, 1974, 2459395
Int. Cl.[2] A61K *31/415;* **C07D** *233/94, 233/95*
U.S. Cl. 424—273 **12 Claims**

1. A 1-alkyl-2-(phenoxymethyl)-5-nitro-imidazole of the formula



wherein R^1 is methyl or ethyl, R^2 is trifluoromethyl, trichloromethyl, nitro, cyano, methylsulfonyl, or ethylsulfonyl, R^3 is hydrogen, fluorine, chlorine, bromine, iodine, trifluoromethyl, trichloromethyl, cyano or nitro, and R^4 is hydrogen or methyl.

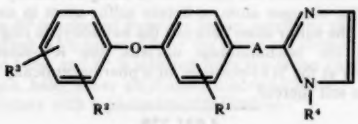
12. A method for treating protozoal diseases which comprises administering an effective amount of a compound as claimed in claim 1.

4,031,233
PHENOXYPHENYL IMIDAZOLYL METHANOLS AND KETONE DERIVATIVES THEREOF

Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 9, 1976, Ser. No. 656,247
Int. Cl.[2] C07D *233/64*
U.S. Cl. 424—273 **27 Claims**

1. A compound which is a member of the group consisting of a free organic base of the formula



wherein

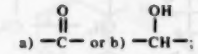
R^1 is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, fluoro or chloro;

R^2 is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, or alkoxy having from 1 to 4 carbon atoms, fluoro or chloro;

R^3 is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, or alkoxy having from 1 to 4 carbon atoms, fluoro or chloro;

R^4 is alkyl having from 1 to 18 carbon atoms; and

A is either



and a

pharmaceutically acceptable acid addition salt thereof; provided that when R^2 and R^3 are on adjacent carbons they are not both alkyl or alkoxy which are branched.

4,031,234
1,5(6)-DISUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATIVES HAVING ANTHELMINTIC ACTIVITY

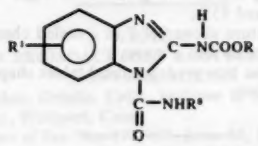
Colin C. Beard, Palo Alto; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 605,704, Aug. 18, 1975, Pat. No. 3,993,769, which is a division of Ser. No. 473,865, May 28, 1974, Pat. No. 3,929,822, which is a continuation-in-part of Ser. No. 417,963, Nov. 21, 1973, Pat. No. 3,929,821, which is a continuation-in-part of Ser. No. 319,299, Dec. 29, 1972, abandoned. This application June 18, 1976, Ser. No. 697,499

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 **36 Claims**

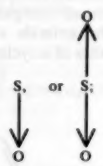
1. A composition for controlling helminths in mammals comprising a pharmaceutically acceptable non-toxic excipient and an anthelmintically effective amount of a compound represented by the formula:



(I)

where

R is lower alkyl having 1 to 4 carbon atoms; R^1 is —SOR^2, —SR^5, —OR^5 or $M'(CH_2)_nMR^7$; R^2 is lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, lower alkenyl or lower alkynyl having 3 to 6 carbon atoms, phenyl, benzyl or phenethyl; R^5 is lower alkenyl, lower alkynyl, benzyl or phenethyl; R^7 is lower alkyl having 1 to 4 carbon atoms or phenyl; M and M′ are independently O, S,



n is 1–4; and R^8 is phenyl, benzyl, phenethyl, or lower alkyl having 1 to 12 carbon atoms and optionally substituted wih a —COOR group where R is lower alkyl having 1 to 4 carbon atoms; the R^1 substitution being at the 5(6)-position; or a pharmaceutically acceptable salt thereof.

4,031,235
INSECTICIDAL SUBSTITUTED ACETATE COMPOUNDS

Keimei Fujimoto, Kobe; Nobuo Ohno, Toyonaka; Yoshitoshi Okuno, Toyonaka; Toshio Mizutani, Toyonaka; Isao Ohno, Minoo; Masachika Hirano, Toyonaka; Nobushige Itaya, Ikeda, and Takashi Matsuo, Amagasaki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

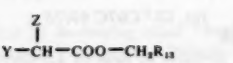
Division of Ser. No. 378,301, July 11, 1973, Pat. No. 3,996,244. This application July 16, 1975, Ser. No. 596,336

Claims priority, application Japan, July 11, 1972, 47-69805

Int. Cl.² A01N *9/22*

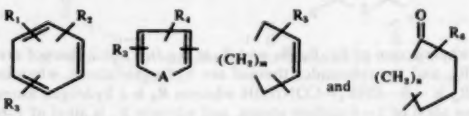
U.S. Cl. 424—274 **6 Claims**

1. A substituted acetate compound of the formula



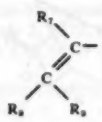
(I)

wherein Y is selected from the group consisting of the formulae:



(II) (III) (IV) (V)

in which R_1 and R_2 are individually hydrogen, halogen, cyano, nitro, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, lower alkoxyalkyl, halogen-substituted lower alkyl, halogen-substituted lower alkenyl, halogen-substituted lower alkynyl, lower alkylthio, lower alkylsulfoxyl, C_2-C_4 alkanoyl, C_2 alkanoyloxy, lower alkoxycarbonyl, lower alkenyloxycarbonyl, lower alkynyloxy-carbonyl, methylenedioxy, tetramethylene or trimethylene group; R_3 and R_4 are individually hydrogen, halogen, cyano, nitro, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, lower alkoxyalkyl, halogen-substituted lower alkyl, halogen-substituted lower alkenyl, halogen-substituted lower alkynyl, lower alkylthio, lower alkylsulfoxyl, C_2-C_4 alkanoyl, lower alkoxycarbonyl, lower alkenyloxycarbonyl or lower alkynyloxycarbonyl group; A represents an oxygen atom or a sulfur atom; R_5 represents hydrogen, halogen, cyano, nitro or lower alkyl group; m is an integer of from 1 to 3; R_6 represents hydrogen, halogen, cyano, nitro or lower alkyl group; n is an integer of from 1 to 3; and the dotted line in the formula (V) represents a double bond present at a position conjugated or non-conjugated with the ketone (C=O), or Y represents a substituted ethylene group of the formula (VI)



(VI)

in which R_7, R_8 and R_9 constitutes a plane together with the double bond at β-γ position of the ester group, and are individually hydrogen, lower alkyl, lower alkenyl, lower alkynyl, or halogen; Z represents a straight or branched lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, cyano, halogen-substituted lower alkyl, halogen-substituted lower alkenyl group or an alicyclic group having 3 to 7 carbon atoms; R_{13} represents phthalimide, thiophthalimide, di- or tetrahydrophthalimide or dialkylmaleimide.

4. A insecticidal and miticidal composition comprising an insecticidally and miticidally effective amount of at least one substituted acetate compound as defined in claim 1 and in an inert carrier.

4,031,236
NOVEL THIOPHENE DERIVATIVES AND THEIR PREPARATION

Hanns Ahrens; Helmut Biere; Clemens Rufer; Ralph Schmiechen; Eberhard Schroeder; Olaf Loge; Wolfgang Losert, and Ekkehard Schillinger, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

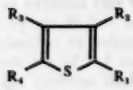
Filed May 20, 1975, Ser. No. 579,258

Claims priority, application Germany, May 21, 1974, 2424742

Int. Cl.² A61K *31/41, 31/38;* **C07D** *257/04, 333/24*

U.S. Cl. 424—275 **18 Claims**

1. A thiophene derivative of the formula



wherein one of R_1, R_2, R_3 and R_4 is R_x; 0, 1, or 2 thereof are R_y, and the remainder thereof are hydrogen atoms, wherein R_x is $-S-CHR_5-CONHOH$ wherein R_5 is a hydrogen atom or alkyl of 1—6 carbon atoms, and wherein R_y is alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms or a halogen atom, including, when R_5 is an alkyl group, their enantiomers, and pharmacologically acceptable salts thereof with inorganic and organic bases.

18. A method of inhibiting lipolysis which comprises administering systemically to a patient with an abnormally high serum free fatty acid level an amount of a compound of claim 1 effective to lower the free fatty acid level.

4,031,237
CARBAMATE INSECTICIDES FROM 5,8-DIHYDRO-5,8-METHANO-1-NAPHTHOL AND ITS DERIVATIVES

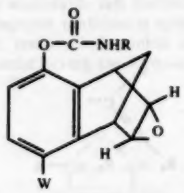
Stanley T. Gough, Branchburg; Michael A. Tebias, Edison, and Roger P. Napier, Somerville, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 764,969, Oct. 3, 1968, abandoned. This application Mar. 30, 1971, Ser. No. 129,628

Int. Cl.² C07D *303/36;* **A01N** *9/28*

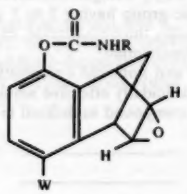
U.S. Cl. 424—278 **6 Claims**

1. A method for combatting insects that comprises contacting them with an insecticidally effective amount of a carbamate having the formula:



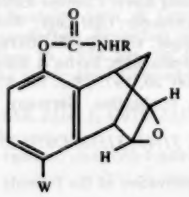
wherein R is alkyl (C_1–C_5) and W is hydrogen or alkoxy (C_1–C_3).

3. An insecticidal composition comprising a carrier and a carbamate having the formula:



wherein R is alkyl (C_1–C_5) and W is hydrogen or alkoxy (C_1–C_3).

5. A carbamate having the formula:



wherein R is alkyl (C_1–C_5) and W is hydrogen or alkoxy (C_1–C_3).

4,031,238
PROCESS FOR PREPARING INSTANT BEVERAGE CUBES

Joanne Reid, Boston, Mass.; Elpidio Leoncio de la Teja, Hackensack, and Francis Farrell, Madison, both of N.J., assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed May 30, 1975, Ser. No. 582,391

Int. Cl.² A23L *2/38;* **A23F** *3/00*

U.S. Cl. 426—285 **6 Claims**

1. A method of manufacturing a water-soluble solid beverage tablet comprising the steps of:

forming a mixture consisting essentially of 16 to 40% powdered glucose monohydrate, 50 to 70% granular sucrose and 1 to 10% powdered hygroscopic flavor material, the sucrose being adjusted to give a total sugar content of between 90 and 95%;

heating the mixture above 95° F in a sealed chamber until the mixture binds into a mass;

forming the mass into predetermined tablet shapes; and

cooling the tablets.

4,031,239
CYCLOPROPANECARBOXYLATES FOR SYSTEMIC CONTROL OF ECTOPARASITES

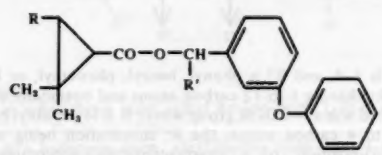
Michael Stanley Schrider, South Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 550,107, Feb. 13, 1975, abandoned. This application Dec. 22, 1975, Ser. No. 643,225

Int. Cl.² A01N *9/20;* **A61K** *31/275*

U.S. Cl. 424—304 **15 Claims**

1. A method for the systemic control of ectoparasites which attack warm-blooded animals comprising orally or parenterally administering to the animals a systemically effective amount against the parasites of a cyclopropanecarboxylic acid of the formula:



wherein R is 2,2-dichlorovinyl- or 2-methyl-propenyl- and R′ is hydrogen or cyano.

4,031,240
2,5-DIHYDROXY BENZENE SULFONIC ACID MONO- AND DIESTERS

Antonio Esteve-Subirana, Barcelona, Spain, assignor to Laboratorios del Dr. Esteve S.A., Barcelona, Spain

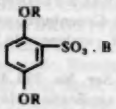
Continuation-in-part of Ser. No. 505,934, Sept. 13, 1974, Pat. No. 3,954,767, which is a continuation-in-part of Ser. No. 360,394, May 14, 1973, Pat. No. 3,876,651. This application Sept. 12, 1975, Ser. No. 612,775

Claims priority, application Switzerland, May 17, 1975, 7327/75

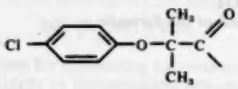
Int. Cl.² C07C *69/76*

U.S. Cl. 424—308 **18 Claims**

1. Mono- and di-esters of salts of 2,5-dihydroxy benzene sulfonic acid, of general formula:



wherein each R residue is hydrogen or the residue of p-chloro phenoxy isobutyric acid of formula:



with the proviso that both Rs are not hydrogen simultaneously, and B is hydrogen or an equivalent of an inorganic or organic cation.

4,031,241

CERTAIN BROMOACETOXY ACETYLENES AS SLIME CONTROL AGENTS

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

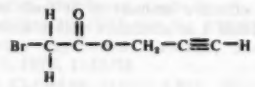
Continuation of Ser. No. 477,957, June 10, 1974, abandoned, which is a continuation of Ser. No. 313,230, Dec. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,189, March 4, 1971, abandoned. This application May 8, 1975, Ser. No. 575,772

The portion of the term of this patent subsequent to Jan. 16, 1990, has been disclaimed.

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—311 **1 Claim**

1. A method of reducing the growth of slime-forming microorganism in an aqueous system comprising adding to said system an effective amount of propargyl monobromoacetate which has the structural formula



4,031,242

DIACYLATED DERIVATIVES OF γ-GLUTAMYL DOPAMINE

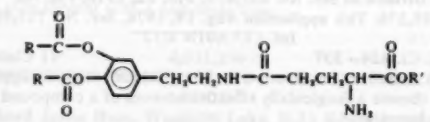
Peter Hadley Jones, Lake Forest; Carroll Wayne Ours, Zion, and Jaroslav Kyncl, Lake Bluff, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Sept. 11, 1975, Ser. No. 612,511

Int. Cl.[2] C07C *69/16, 69/28;* **A61K** *31/22, 31/23*

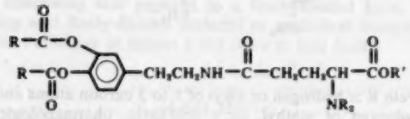
U.S. Cl. 424—311 **16 Claims**

1. A diacylated derivative of γ-glutamyl dopmaine selected from the group consisting of



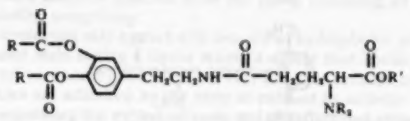
where R is a C_1–C_{12} straight or branched chain alkyl radical and R′ is H, and a pharmaceutically acceptable acid addition salt thereof.

13. A method of increasing renal blood flow of warm-blooded animals which comprises administering to said mammals at least an effective amount of a renal vasodilator compound comprising a diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a C_1–C_{12} straight or branched chain alkyl radical and R′ is H, and a pharmaceutically acceptable acid addition salt thereof.

15. A pharmaceutical composition in unit dosage form effective in increasing renal blood flow which comprises an active portion comprising a diacylated derivative of γ-glutamyl dopamine selected from the group consisting of



where R is a C_1–C_{12} straight or branched chain alkyl radical and R′ is H, and a pharmaceutically acceptable carrier.

4,031,243

2-(4-ISOBUTYL PHENYL)BUTYRIC ACID, SALTS THEREOF, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Luis Aparicio; Nenesio Gayo; José M[a] Carretero; Jose Luis Martin, and Armando Ron, all of Madrid, Spain, assignors to Juste, S.A. Quimico-Farmaceutica, Madrid, Spain

Filed July 3, 1975, Ser. No. 593,059

Int. Cl.[2] A61K *27/00, 31/19*

U.S. Cl. 424—317 **9 Claims**

1. 2-(4-Isobutylphenyl)butyric acid or a pharmaceutically acceptable salt thereof.

5. A pharmaceutical composition having antiinflammatory, analgesic and antipyretic properties comprising 2-(4-isobutylphenyl)butyric acid or a pharmaceutically acceptable salt thereof as defined in claim 1 together with a carrier therefor, the acid or salt being present in an amount from 200 to 400 mg per unit dose.

4,031,244

PHARMACEUTICAL COMPOSITIONS CONTAINING A 1-(2,6-DIMETHYL-PHENOXY)-2-AMINO-ALKANE AND METHOD OF USE

Herbert Koppe; Karl Zeile; Werner Kummer; Helmut Stahle, and Peter Danneberg, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

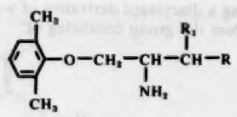
Division of Ser. No. 511,063, Oct. 1, 1974, Pat. No. 3,954,872, which is a continuation-in-part of Ser. No. 86,983, Nov. 4, 1970, abandoned, which is a continuation-in-part of Ser. No. 871,619, Nov. 14, 1969, abandoned, which is a continuation of Ser. No. 667,665, Sept. 14, 1967, abandoned. This application Jan. 29, 1976, Ser. No. 653,296

Claims priority, application Germany, Sept. 16, 1966, 88950; Aug. 17, 1967, 94024

Int. Cl.[2] A61K *31/135*

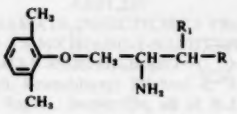
U.S. Cl. 424—330 **8 Claims**

1. A pharmacodynamic dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective anticonvulsive or antiarrhythmic amount of a racemic or optically active compound of the formula



wherein R is hydrogen or alkyl of 1 to 3 carbon atoms and R_1 is hydrogen or methyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. The method of suppressing convulsions and alleviating cardiac arrhythmia in a warm-blooded animal in need of such treatment, which comprises administering to said animal an effective anticonvulsive or antiarrhythmic dose of a racemic or optically active compound of the formula



wherein R is hydrogen or alkyl of 1 to 3 carbon atoms and R_1 is hydrogen or methyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,031,245
ALKENYL AND ALKANYLAMINES FOR TREATING DEPRESSION

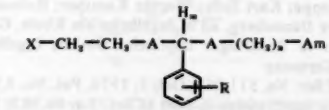
William John Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 221,825, Jan. 28, 1972, Pat. No. 3,978,129. This application Apr. 7, 1976, Ser. No. 674,706

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **9 Claims**

1. A process for treating depression in a living animal body which comprises administering to said animal body for its antidepressant effect an effective amount of a compound selected from phenyl-ω-haloalkenylamines and phenyl-ω-haloalkanylamines having the formula:



wherein,

Am is selected from lower-alkylamino and di-lower-alkylamino,

A is selected from methylene and methylidyne,

R is selected from hydrogen, lower-alkyl, lower-alkoxy, halogen and trifluoromethyl,

m is zero or one,

n is one or two,

X is halogen, and

a pharmaceutically acceptable acid addition salt thereof.

4,031,246
ARYLOXYALKYL DIKETONES

Joseph C. Collins, East Greenbush, and Guy D. Diana, Stephentown, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

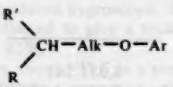
Continuation-in-part of Ser. No. 381,406, July 23, 1973, Pat. No. 3,933,837. This application May 12, 1975, Ser. No. 576,311

Claims priority, application United Kingdom, July 11, 1974, 30800/74

Int. Cl.² A01N *9/24;* **A61K** *31/12;* **C07C** *49/76*

U.S. Cl. 424—331 **47 Claims**

1. A compound of the formula



wherein:

Alk is alkylene of 3 to 10 carbon atoms optionally interrupted by an oxygen atom separated by at least two carbon atoms from the terminal bonds of Alk;

R and R′ are alkanoyl of 2 to 6 carbon atoms;

and Ar is phenyl or phenyl substituted by one to three substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkoxyalkoxy of 3 to 6 carbon atoms, hydroxyalkoxy of 2 to 4 carbon atoms, halogen, nitro, acetyl, trifluoromethyl, trifluoromethoxy, hydroxy, and benzyloxy.

42. A composition for combatting arthropods by hindering their maturation which comprises an effective amount of at least one compound according to claim 1 in admixture with a suitable carrier or diluent.

44. A composition for combatting viruses which comprises an antivirally effective amount of at least one compound according to calim 1 in admixture with a suitable carrier or diluent.

4,031,247
FUNGICIDAL VINYL 2-SUBSTITUTED-THIOVINYL SULFONES

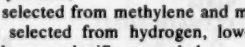
Philip S. Magee, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 657,679, Feb. 12, 1976, Pat. No. 3,988,376. This application Aug. 19, 1976, Ser. No. 715,959

Int. Cl.² A01N *9/12*

U.S. Cl. 424—337 **11 Claims**

1. A method for the control of fungi which comprises applying thereto a fungicidally effective amount of a compound of the formula



wherein R is alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from the group consisting of fluoro, chloro, bromo, nitro and alkyl of to 4 carbon atoms.

4,031,248

MICROBICIDAL AGENTS CONTAINING AS ACTIVE INGREDIENT MONOHYDROXYPHENYL CARBINOLS

Max Schellenbaum, Muttenz; Max Duennenberger, Frenkendorf, and Fulvio Casagrande, Binningen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

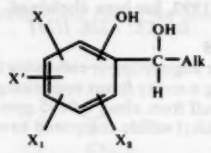
Division of Ser. No. 553,350, Feb. 26, 1975, Pat. No. 3,944,652, which is a division of Ser. No. 164,446, July 20, 1971, Pat. No. 3,879,477. This application Dec. 10, 1975, Ser. No. 639,558

Claims priority, application Switzerland, July 23, 1970, 11172/70

Int. Cl.[2] A01N 9/26

U.S. Cl. 424—347 10 Claims

1. A composition for combatting bacteria or fungi comprising (1) a fungicidally or bactericidally effective amount of a compound of the formula



wherein each of X and X′ is halogen, each of X_1 and X_2 is hydrogen or halogen, Alk is straight or branched chain alkyl having from 1 to 8 carbon atoms, and the hydroxy group is in the 2- or 4-position to the carbinol bridge, and (2) a carrier.

4,031,249

COMPOSITIONS CONTAINING CERTAIN 2,4-HALO-6-NITROPHENOLS OR DERIVATIVES THEREOF AND METHODS FOR USING SAME TO ERADICATE INTERNAL PARASITES IN WARM-BLOODED ANIMALS

Bruce Adam Forsyth, Croydon; David Ernest Pryor, Balwyn; Errol James McGarry, Bundoora, and Donald William Gerald Harney, Doncaster, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed May 19, 1975, Ser. No. 578,811

Claims priority, application Australia, June 7, 1974, 7826/74; Apr. 7, 1975, 1153/75

Int. Cl.[2] A61K 31/055; C07C 79/22

U.S. Cl. 424—347 10 Claims

1. A compound chosen from the group consisting of 2-chloro-4-fluoro-6-nitrophenol and salts thereof with non-toxic bases.

3. A method of treating warm blooded animals to eradicate trematodes and nematodes; which method comprises administering to warm blooded animal in need of such treatment an effective amount of a compound selected from the group consisting of

2,4-dibromo-6-nitrophenol
2,4-dichloro-6-nitrophenol
2-chloro-4-fluoro-6-nitrophenol
2-bromo-4-fluoro-6-nitrophenol
2-iodo-4-fluoro-6-nitrophenol
2-bromo-4-chloro-6-nitrophenol

and salts thereof with a non-toxic base.

4,031,250

METHOD FOR IMPARTING RED COLOR TO ANIMAL FOOD

Gerhard Julius Haas, Woodcliff Lake, N.J.; Edwin Bernard Herman, Croton-on-Hudson, and Joaquin Castro Lugay, Thornwood, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,710

Int. Cl.[2] A21D 2/00; A23K 1/18

U.S. Cl. 426—18 9 Claims

1. A method for imparting a meaty red color to an animal food comprising culturing *Monascus Purpureus* on a material selected from the group consisting of rice, corn, and mixtures thereof to obtain red pigments thereon, subdividing said material containing said pigment to a finely-divided form, and adding said finely-divided material to an animal food in an amount effective to impart a red color to said food.

4,031,251

DECAFFEINATION OF VEGETABLE MATERIAL

Geoffrey Margolis, Marysville; Dean Frederick Rushmore, Delaware, and Richard Tien-Szu Liu, Worthington, all of Ohio, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Jan. 8, 1975, Ser. No. 539,535

Int. Cl.[2] A23F 1/10

U.S. Cl. 426—387 16 Claims

1. A process for the decaffeination of aqueous extract of a vegetable material selected from the group consisting of tea and coffee comprising:

a. contacting said extract with non-ionic, hydrophobic polymer resin having a dipole moment of less than about 2.0 debye whereby sufficient caffeine and non-caffeine solubles are adsorbed by the resin to exhaust its activity;
b. separating the exhausted resin and decaffeinated extract;
c. leaching said exhausted resin and adherent caffeine and non-caffeine solubles with water to selectively remove caffeine;
d. eluting the caffeine-free resin with a wash solution comprising water and organic solvent to remove non-caffeine solubles;
e. removing said solvent from said resin by rinsing with water; and
f. contacting the rinsed resin with aqueous extract of vegetable material further to absorb caffeine.

4,031,252

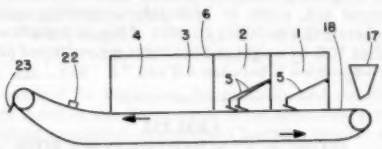
DOCTORING AND DRYING METHOD

John F. Sullivan, Drexel Hill; Richard P. Konstance, Philadelphia, and Wolfgang K. Heiland, Trevose, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 10, 1976, Ser. No. 665,588

Int. Cl.[2] F26B 3/00; A23P 1/00

U.S. Cl. 426—445 2 Claims



1. In a process for dyring comestibles and preparing them for puffing wherein pieces of comestibles are transported on a moving belt through a multi-zoned hot air dryer, the improvement which comprises, providing at least the first two zones of the dryer with a plurality of doctoring units, each of said units being a combination doctor blade and V-shaped member wherein the doctor blade is detachably fastened to the V-shaped member and the leading edge of the doctor blade is parallel to the plane of the moving belt and the leading edge formed by the two plane faces of the V-shaped member is generally perpendicular to the plane of the belt when the unit is in doctoring position and wherein each unit is provided with means for applying doctoring force and is supported by an extension arm which is pivotally mounted, arranging said units spacially to provide room for doctored pieces to tumble freely and to allow the complete width of the belt to be doctored, applying the units such that they doctor the comestibles from the belt and impart to the pieces a lateral movement combined

with a tumbling action, and then transferring the pieces directly to a puffing operation.

4,031,253

PROCEDURE FOR PRESERVING ROOT CROPS BY DEEP FREEZING AND THEIR PEELING

Mikko Tapani Suortti; Yrjö Mälkki, both of Espoo, and Olavi Elis Nikkilä, Helsinki, all of Finland, assignors to Mikko Tapani Suortti and Yrjo Malkki, both of Espoo, Finland

Filed Nov. 3, 1975, Ser. No. 628,491

Claims priority, application Finland, Nov. 6, 1974, 3236/74

Int. Cl.² A23B *7/04*

U.S. Cl. 426—482 **3 Claims**

1. In a process for preserving fully ripened potatoes and other root crops requiring peeling by boiling or parboiling followed by deep freezing, the improvement which comprises carrying out the boiling or parboiling and deep freezing while the crops are in the unpeeled state, peeling the crops in the deep frozen state and wherein the germ buds and up to 50% of the peel of the root crop are removed prior to deep freezing.

4,031,254

INSTANT CHEESE, CHEESE SAUCES AND RELATED COMPOSITIONS

Robert L. Kasik, Berwyn, and Marvin A. Peterson, Park Ridge, both of Ill., assignors to Beatrice Foods Co., Chicago, Ill.

Continuation-in-part of Ser. No. 455,510, March 27, 1974, Pat. No. 3,917,854. This application Nov. 3, 1975, Ser. No. 628,561

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.² A23C *19/12*

U.S. Cl. 426—573 **20 Claims**

1. A dry composition which is capable of being instantly reconstituted with water to form a cheese-substitute, comprising a mixture of:

1. co-dried particles containing (a) at least one base neutralized casein wherein the base is selected from the group consisting of a magnesium, potassium, magnesium/potassium, sodium/potassium and sodium/magnesium base, and (b) at least one fat having a melting point of 130° F. or less, the weight ratio of the neutralized casein to the fat being 1:3-to-3:1; and
2. a congealing amount of an alkali metal or alkaline earth metal salt, oxide or hydroxide congealing agent; and wherein the moisture content of the composition is less than 10% by weight and the water-reconstituted pH of the composition is between 4.0 and 7.0.

4,031,255

FIXING ACETALDEHYDE IN SUCROSE

Peter Donato Malizia, Port Chester, N.Y., and William Alexander Mitchell, Lincoln Park, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed July 3, 1975, Ser. No. 593,145

Int. Cl.² A23L *1/226*

U.S. Cl. 426—534 **10 Claims**

1. An improved method for fixing acetaldehyde in sucrose which comprises:

a. obtaining, at a temperature of below about 20° C, a glassy, aqueous, supersaturated sucrose solution containing from about 80 to 93% sucrose, based on the combined weight of sucrose and water;

b. mixing acetaldehyde with said glassy, aqueous supersaturated sucrose solution sufficiently to at least partially dissolve the acetaldehyde therein and initiate crystallization of the sucrose;

c. contacting the resulting mixture with a stream of drying gas during the mixing operation to at least partially dry the mixture as crystallization proceeds; and

d. recovering, as a product, crystalline sucrose having acetaldehyde fixed therein.

4,031,256

FOODSTUFF FLAVOR COMPOSITIONS COMPRISING 3-FURYL ALKYL SULFIDES AND PROCESSES

William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet, and Bernard J. Mayers, Cliffwood, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

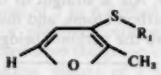
Continuation-in-part of Ser. No. 639,754, Dec. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 551,150, Feb. 19, 1975, abandoned. This application Sept. 15, 1976, Ser. No. 723,531

The portion of the term of this patent subsequent to May 30, 1992, has been disclaimed.

Int. Cl.² A23L *1/231*

U.S. Cl. 426—535 **6 Claims**

1. A process for augmenting or enhancing the nutty notes of a foodstuff having a meaty flavor comprising the step of adding to said foodstuff from about 0.0005 ppm up to about 250 ppm of a 3-furyl alkyl sulfide compound having the structure:



wherein R_1 is selected from the group consisting of methyl and 3-methyl-1-butyl.

4,031,257

USE IN FOODSTUFF FLAVORING COMPOSITIONS OF FIVE OR SIX MEMBERED HETEROCYLIC OXATHIO COMPOUNDS

Richard A. Wilson, Westfield; John V. Pascale, Jackson, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

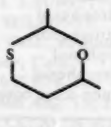
Filed July 8, 1975, Ser. No. 594,310

Int. Cl.² A23L *1/226*, *1/231*, *1/235*

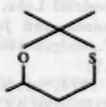
U.S. Cl. 426—535 **8 Claims**

1. A process for augmenting or enhancing the fruit or vegetable taste or aroma of a foodstuff comprising the step of adding to said foodstuff from 0.03 up to 50 ppm of an oxathio heterocyclic compound selected from the group consisting of:

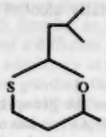
2,6-dimethyl-1,3-oxathiane having the structure:



2,2,6-trimethyl-1,3-oxathiane having the structure:

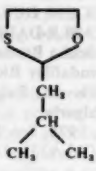


2-isobutyl-6-methyl-1,3-oxathiane having the structure:

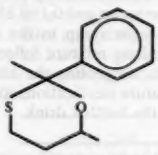


2,2-dimethyl-1,3-oxathiolane having the structure:

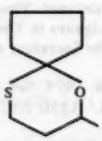
2-isobutyl-1,3-oxathiolane having the structure:



2,6-dimethyl-2-phenyl-1,3-oxathiane having the structure:



and 7-methyl(6-oxa-10-thiaspiro)4.5-decane having the structure:



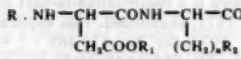
4,031,258

INORGANIC SALTS OF DIPEPTIDE SWEETENERS

Gerhard J. Haas, Woodcliff Lake, N.J., and Jeffrey H. Berg, Riverdale, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 30, 1972, Ser. No. 239,792
Int. Cl.² A23L *1/236*
U.S. Cl. 426—548 **19 Claims**

1. An artificially sweetened foodstuff comprising a foodstuff and a dry dipeptide salt sweetener selected from the formula



wherein:

The stereochemical configuration is DL-DL, DL-L, L-DL or L-L;

when R_1 is hydrogen, R is $H_2SO_4^+$, $H_4PO_4^+$, or $H_2NO_3^+$; *n* represents an integer of 0 to 5;

where R hydrogen, R_1 is sodium, potassium, calcium, or ammonium;

R_3 represents lower alkyl, lower alkylaryl and cycloalkyl;

R_2 represents

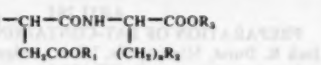
a. lower alkyl

b. a substituted or unsubstituted, partially saturated or totally saturated six carbon ring provided that when substituted, the substituent is at the four position and is hydroxy, lower alkoxy, lower alkyl or halogen; and

c. $S(O)_m$ (lower alkyl) provided that *n* is 1 or 2 and *m* is 0, or 2,

said dry dipeptide salt sweetener being present in an amount effective to sweeten the foodstuff, said dipeptide salt being faster to dissolve than the corresponding unsubstituted dipeptide sweetener.

15. A dry salt of a dipeptide sweetener selected from the formula



wherein:

the stereochemical configuration is DL-DL, DL-L, L-DL, or L-L;

n represents an integer of 0 to 5;

Where R is hydrogen, R_1 is sodium, potassium, calcium or ammonium;

Where R_1 is hydrogen, R is $H_2SO_4^+$, $H_4PO_4^+$, or $H_2NO_3^+$

R_3 represents lower alkyl, lower alkylaryl and cycloalkyl;

R_2 represents

a. lower alkyl

b. a substituted or unsubstituted, partially saturated or totally saturated six carbon ring provided that when substituted, the substituent is at the four position and is hydroxy, lower alkoxy, lower alkyl or halogen; and

c. $S(O)_m$ (lower alkyl) provided that *n* is 1 or 2 and *m* is 0, 1, or 2.

4,031,259

PROCESS OF PREPARING NUTRITIVE SWEETENING COMPOSITIONS

Joaquin Castro Lugay, Thornwood, and Jacob Richard Feldman, New City, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 13, 1975, Ser. No. 604,289
Int. Cl.² A23L *1/236*
U.S. Cl. 426—548 **9 Claims**

1. A method for improving the solubility and stability of dipeptide nutritive sweetners, while at the same time producing a bulked sweetening composition having a broader spectrum of amino acids which comprises co-drying an aqueous solution of at least one of said sweeteners with a nutritious, bland low molecular weight polypeptide, the sweetener and polypeptide being present in solution at from about equimolar amounts to weight ratios of sweetener to polypeptide of 1:100, which sweetener and polypeptide are present at concentrations at which both are soluble.

4,031,260

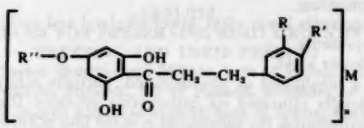
SALTS OF DIHYDROCHALCONE DERIVATIVES AND THEIR USE AS SWEETENERS

Edward B. Westall, San Jacinto, and Alan W. Messing, Hemet, both of Calif., assignors to Nutrilite Products, Inc., Buena Park, Calif.

Division of Ser. No. 143,632, May 14, 1971, Pat. No. 3,984,394. This application July 19, 1976, Ser. No. 706,135
Int. Cl.² A23L *1/236*
U.S. Cl. 426—548 **5 Claims**

5. Process of sweetening foods or beverages which com-

prises incorporating therein an effective sweetening amount of a monobasic metal salt of a dihydrochalcone of the formula



wherein R is selected from the group consisting of hydrogen and hydroxy, R' is selected from the group consisting of hydroxy and C_1 to C_3 alkoxy, and R'' is selected from the group consisting of neohesperidosyl, β-rutinosyl, and β-D-glucosyl, M is a mono- or divalent non-toxic metal selected from the group consisting of alkali metals and alkaline earth metals, and *n* is an integer corresponding to the valence of said selected of said selected metal M.

4,031,261

PREPARATION OF FAT-CONTAINING BEVERAGES

Jack R. Durst, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 351,729, April 16, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,757

Int. Cl.² A23G 9/00, 9/04

U.S. Cl. 426—565 **18 Claims**

1. A method of preparing fat containing beverages for frozen storage and reconstitution by thawing comprising mixing about ½ to 4 parts edible hydrophilic film former and water in proportion to form a saturated solution of the film former in the water as determined by the B saturation test for determination of a viscosity break point, vigorously mixing one part edible fat in a liquid state with the film former and water to encapsulate the fat and form a stable dispersion while the film former is saturated as determined by said test, thereafter adding at least 10% more water than that already present in the dispersion to dilute the dispersion to the reconstituted consistency of the fat containing beverage being prepared and providing 50–90% water in the final product, mixing to produce a smooth uniform dispersion and over-run and freezing to a hard solid mass.

4,031,262

ICE CREAM AND THE PROCESS FOR MAKING SAME

Michio Nakayama, and Setuko Nakayama, both of Hirakata, Japan, assignors to Eigo Tojo and Sadao Nakayama, both of, Japan

Filed July 13, 1976, Ser. No. 704,930

Claims priority, application Japan, July 18, 1975, 50-88516; July 18, 1975, 50-101802[U]

Int. Cl.² A23G 9/00, 9/04

U.S. Cl. 426—565 **16 Claims**

1. A process for making ice cream which comprises admixing soft ice cream and ice granules of about 1–350 mm^3 in size, in a ratio such that the content of ice granules is about 5–30 volume percent, and freezing the mixture.

4,031,263

MANUFACTURE OF FOOD POWDERS

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Montjay-la-Tour, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 268,454, July 3, 1972, abandoned, which is a continuation of Ser. No. 882,720, Dec. 5, 1969, abandoned. This application July 9, 1974, Ser. No. 486,918

Claims priority, application Luxembourg, Sept. 12, 1968, 57499

Int. Cl.² A23C 9/00

U.S. Cl. 426—588 **4 Claims**

3. A dry powdered milk product having improved water dispersibility and anti-foaming properties consisting essentially of an intimate mixture of milk and a non-ionic surface active agent which is a fatty alcohol derivative having the formula

$$RO\text{-}(C_2H_3O\ (A))_n\text{-}H$$

wherein A is selected from the group consisting of $-CH_2OH$ and $-CH_2OCH_2CHOHCH_2OH$, *n* has a value of 2–10 when A is $-CH_2OH$ and a value of 1–5 when A is $-CH_2OCH_2CHOHCH_2OH$, R is selected from the group consisting of alkyl, alkenyl and carbonyl alkenyl, wherein each of said alkyl and alkenyl groups is a straight chain having 8–22 carbon atoms, the iodide index of R being about 30–95 and the melting point of fatty alcohols from which said derivative is prepared being less than 50° C, said non-ionic surface active agent being present in amounts of about 0.1–5 percent by weight of said product.

4,031,264

METHOD FOR PRODUCING DURABLE FRUIT-DAIRY AND VEGETABLE-DAIRY DRINKS

Angel Tomov Arolski; Velichka Borissova Usheva; Peter Vasilev Gruev; Georgi Trendafilov Richev, and Zvetana Semkova Doncheva, all of Plovdiv, Bulgaria, assignors to DSO "Bulgarplod", Sofia, Bulgaria

Filed May 15, 1975, Ser. No. 577,574

Int. Cl.² A23L 2/02

U.S. Cl. 426—590 **5 Claims**

1. Method for producing durable fruit-dairy or vegetable-dairy drinks containing 20 to 40% natural fruit or vegetable mash and 36 to 46% sour milk derived from skimmed or whole milk, apple pectin, sugar syrup and 0.1–0.2% citric acid which comprises adding the sugar syrup to the sour milk, adding apple pectin to the resulting mixture followed by adding the fruit or vegetable mash, subjecting the resulting mixture to short time high temperature sterilization, cooling, bottling and additionally sterilizing the bottled drink.

4,031,265

METHOD OF REDUCING BITTERNESS IN CITRUS JUICES

Dante G. Guadagni, Moraga; Robert M. Horowitz, Pasadena; Bruno Gentili, Glendale, and Vincent P. Maier, Newport Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 18, 1975, Ser. No. 587,922

Int. Cl.² A23L 2/02, 2/26

U.S. Cl. 426—599 **4 Claims**

1. A process for reducing bitterness in navel orange juice, said bitterness resulting from the presence of limonin in the juice, which comprises -

adding to the juice neodiosmin in an amount sufficient to reduce the bitterness therein.

4,031,266

RECONSTITUTABLE TOMATO BEVERAGE COMPOSITIONS

William A. Mitchell, Lincoln Park, N.J., and William C. Seidel, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 442,721, Feb. 14, 1974, abandoned, which is a continuation of Ser. No. 306,248, Nov. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 167,019, July 28, 1971, abandoned. This application Nov. 26, 1975, Ser. No. 635,469

Int. Cl.² A23L 2/10

U.S. Cl. 426—599 **5 Claims**

1. A process for producing a dehydrated reconstitutable tomato beverage composition characterized by viscosities,

taste, textures, and the general appearance of conventional tomato beverages upon reconstitution, Comprising placing a starch material in an aqueous slurry and adjusting the slurry to a pH of about 6.5 to 7.5, forming an aqueous admixture of said slurry, tomato solids and a different gelatinizable starch material, drum drying said admixture at temperatures from about 120° C to 150° C, fine grinding the same to a fine powder which will pass through a 100 U.S. mesh screen, the ratio of said starch material to water in said admixture being such that limited rupture of the starch material occurs during drying, said ratios being from about 1:9 to 4:1 parts starch to parts water, said pH adjustment effective to reduce off flavor in the dehydrated tomato beverage.

4,031,267

EXPANDED PROTEIN PRODUCT AND METHOD OF MAKING SAME

Martin F. Berry; Stanley H. Reesman; Marvin L. Smith, all of Battle Creek, and Peter Van Middlesworth, Climax, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 211,758, Dec. 23, 1971, abandoned. This application Aug. 25, 1975, Ser. No. 607,416

Int. Cl.² A23J *3/00*

U.S. Cl. 426—656 **21 Claims**

9. An edible protein product comprising an expanded proteinaceous material, said product having an open, cellular, fibrous structure and a fatty glyceride content of from 8.13% up to about 35% by dry weight and prepared by heat processing and mechanically working a composition containing an admixture of a proteinaceous material having a protein content of at least 30% by weight, from 0 to about 35% by dry weight of added fatty glyceride, between about 0.1 to about 20% by dry weight of a non-proteinaceous and non-farinaceous finely divided filler material capable of binding up fatty glyceride, and 0.01 to 2.5% by weight of sulfur or a sulfur compound, said filler comprising microcrystalline cellulose or cellulose fiber or floc.

4,031,268

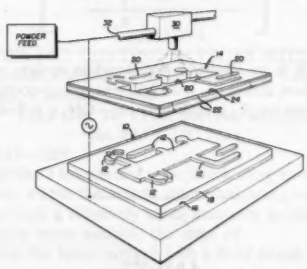
PROCESS FOR SPRAYING METALLIC PATTERNS ON A SUBSTRATE

Thomas E. Fairbairn, Westland, Mich., assignor to Sirius Corporation, Toledo, Ohio

Filed Jan. 5, 1976, Ser. No. 646,226

Int. Cl.² B05D *1/10*

U.S. Cl. 427—12 **5 Claims**



1. In a method of spraying metallic patterns such as conductors of an electrical circuit onto a metallic supporting surface of a supporting base including cleaning and roughening the supporting surface; spraying a powdered bonding material onto the supporting surface by means of the flame spray process; spraying a powdered ceramic insulation layer onto the supporting surface by means of the flame spray process; and applying a self-supporting template to the ceramic-coated supporting surface, said template conforming the desired configuration of the electrical circuit conductors; the improvement comprising: spraying a powdered electrically conductive material through said template and onto said ceramic-coated surface by means of the flame spray process with a spray gun having a powder feed orifice and simultaneously apply a low amperage high voltage A.C. signal between the powder feed orifice of said gun and said metallic supporting surface; whereby an electrical circuit corresponding to the configuration of said template is formed on top of said ceramic-coated surface, with said ceramic coating insulating said current conductors from said metallic supporting surface.

4,031,269

ELECTROSTATIC IMAGE FORMING METHOD

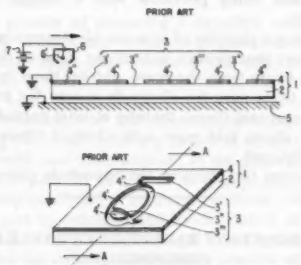
Isoji Takahashi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 25, 1974, Ser. No. 482,869

Claims priority, application Japan, June 25, 1973, 48-72021

Int. Cl.² G03G *13/00*

U.S. Cl. 427—24 **10 Claims**

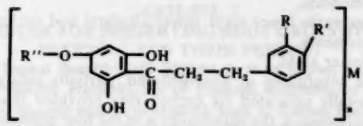


1. An electrostatic image forming method comprising:

uniformly charging with corona discharge a first surface of an electrostatic image forming member comprising an electrically insulating support having a surface resistance greater than about $10^{13}\Omega/cm^2$ and a conductive layer having a surface resistance less than about $10^{9}\Omega/cm^2$ disposed on said insulating support, said layer having open portions which form a pattern therein and expose the recessed surface of said insulating support member, said support member comprising the only support for said conductive layer where an optional insulative intermediate layer may be disposed between said conductive layer and said support member, the pattern formed in said conductive layer resulting in conductive layer portions completely surrounded by recessed surface portions of said insulating support, the uniform charging being such that all conductive layer portions are electrically isolated from the earth during the charging so that the surfaces of all said conductive layer portions and said recessed surface portions of said insulating support are uniformly charged; and

subsequently grounding the surfaces of all of the charged conductive layer portions to the earth by connecting said last-mentioned portions to earth by an electrical conductor so as to remove the charges therefrom so that the charges in the said recessed surface portions of the insulating support remain as an electrostatic latent image.

prises incorporating therein an effective sweetening amount of a monobasic metal salt of a dihydrochalcone of the formula



wherein R is selected from the group consisting of hydrogen and hydroxy, R′ is selected from the group consisting of hydroxy and C_1 to C_3 alkoxy, and R″ is selected from the group consisting of neohesperidosyl, β-rutinosyl, and β-D-glucosyl, M is a mono- or divalent non-toxic metal selected from the group consisting of alkali metals and alkaline earth metals, and *n* is an integer corresponding to the valence of said selected of said selected metal M.

4,031,261

PREPARATION OF FAT-CONTAINING BEVERAGES

Jack R. Durst, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 351,729, April 16, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 556,757

Int. Cl.² A23G *9/00*, *9/04*

U.S. Cl. 426—565 **18 Claims**

1. A method of preparing fat containing beverages for frozen storage and reconstitution by thawing comprising mixing about ½ to 4 parts edible hydrophilic film former and water in proportion to form a saturated solution of the film former in the water as determined by the B saturation test for determination of a viscosity break point, vigorously mixing one part edible fat in a liquid state with the film former and water to encapsulate the fat and form a stable dispersion while the film former is saturated as determined by said test, thereafter adding at least 10% more water than that already present in the dispersion to dilute the dispersion to the reconstituted consistency of the fat containing beverage being prepared and providing 50–90% water in the final product, mixing to produce a smooth uniform dispersion and over-run and freezing to a hard solid mass.

4,031,262

ICE CREAM AND THE PROCESS FOR MAKING SAME

Michio Nakayama, and Setuko Nakayama, both of Hirakata, Japan, assignors to Eigo Tojo and Sadao Nakayama, both of, Japan

Filed July 13, 1976, Ser. No. 704,930

Claims priority, application Japan, July 18, 1975, 50-88516; July 18, 1975, 50-101802[U]

Int. Cl.² A23G *9/00*, *9/04*

U.S. Cl. 426—565 **16 Claims**

1. A process for making ice cream which comprises admixing soft ice cream and ice granules of about 1–350 mm^3 in size, in a ratio such that the content of ice granules is about 5–30 volume percent, and freezing the mixture.

4,031,263

MANUFACTURE OF FOOD POWDERS

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Montjay-la-Tour, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 268,454, July 3, 1972, abandoned, which is a continuation of Ser. No. 882,720, Dec. 5, 1969, abandoned. This application July 9, 1974, Ser. No. 486,918

Claims priority, application Luxembourg, Sept. 12, 1968, 57499

Int. Cl.² A23C *9/00*

U.S. Cl. 426—588 **4 Claims**

3. A dry powdered milk product having improved water dispersibility and anti-foaming properties consisting essentially of an intimate mixture of milk and a non-ionic surface active agent which is a fatty alcohol derivative having the formula

$$RO\text{-}(C_3H_6O)_n\text{-}H$$

wherein A is selected from the group consisting of $-CH_2OH$ and $-CH_2OCH_2CHOHCH_2OH$, *n* has a value of 2–10 when A is -13 CH_2OH and a value of 1–5 when A is $-CH_2OCH_2$. $CHOHCH_2OH$, R is selected from the group consisting of alkyl, alkenyl and carbonyl alkenyl, wherein each of said alkyl and alkenyl groups is a straight chain having 8–22 carbon atoms, the iodide index of R being about 30–95 and the melting point of fatty alcohols from which said derivative is prepared being less than 50° C, said non-ionic surface active agent being present in amounts of about 0.1–5 percent by weight of said product.

4,031,264

METHOD FOR PRODUCING DURABLE FRUIT-DAIRY AND VEGETABLE-DAIRY DRINKS

Angel Tomov Arolski; Velichka Borissova Usheva; Peter Vassilev Gruev; Georgi Trendafilov Richev, and Zvetana Semkova Doncheva, all of Plovdiv, Bulgaria, assignors to DSO "Bulgarplod", Sofia, Bulgaria

Filed May 15, 1975, Ser. No. 577,574

Int. Cl.² A23L *2/02*

U.S. Cl. 426—590 **5 Claims**

1. Method for producing durable fruit-dairy or vegetable-dairy drinks containing 20 to 40% natural fruit or vegetable mash and 36 to 46% sour milk derived from skimmed or whole milk, apple pectin, sugar syrup and 0.1–0.2% citric acid which comprises adding the sugar syrup to the sour milk, adding apple pectin to the resulting mixture followed by adding the fruit or vegetable mash, subjecting the resulting mixture to short time high temperature sterilization, cooling, bottling and additionally sterilizing the bottled drink.

4,031,265

METHOD OF REDUCING BITTERNESS IN CITRUS JUICES

Dante G. Guadagni, Moraga; Robert M. Horowitz, Pasadena; Bruno Gentili, Glendale, and Vincent P. Maier, Newport Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 18, 1975, Ser. No. 587,922

Int. Cl.² A23L *2/02*, *2/26*

U.S. Cl. 426—599 **4 Claims**

1. A process for reducing bitterness in navel orange juice, said bitterness resulting from the presence of limonin in the juice, which comprises -

adding to the juice neodiosmin in an amount sufficient to reduce the bitterness therein.

4,031,266

RECONSTITUTABLE TOMATO BEVERAGE COMPOSITIONS

William A. Mitchell, Lincoln Park, N.J., and William C. Seidel, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 442,721, Feb. 14, 1974, abandoned, which is a continuation of Ser. No. 306,248, Nov. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 167,019, July 28, 1971, abandoned. This application Nov. 26, 1975, Ser. No. 635,469

Int. Cl.² A23L *2/10*

U.S. Cl. 426—599 **5 Claims**

1. A process for producing a dehydrated reconstitutable tomato beverage composition characterized by viscosities,

taste, textures, and the general appearance of conventional tomato beverages upon reconstitution, Comprising placing a starch material in an aqueous slurry and adjusting the slurry to a pH of about 6.5 to 7.5, forming an aqueous admixture of said slurry, tomato solids and a different gelatinizable starch material, drum drying said admixture at temperatures from about 120° C to 150° C, fine grinding the same to a fine powder which will pass through a 100 U.S. mesh screen, the ratio of said starch material to water in said admixture being such that limited rupture of the starch material occurs during drying, said ratios being from about 1:9 to 4:1 parts starch to parts water, said pH adjustment effective to reduce off flavor in the dehydrated tomato beverage.

4,031,267
EXPANDED PROTEIN PRODUCT AND METHOD OF MAKING SAME

Martin F. Berry; Stanley H. Reesman; Marvin L. Smith, all of Battle Creek, and Peter Van Middlesworth, Climax, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

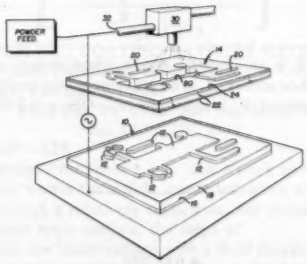
Continuation of Ser. No. 211,758, Dec. 23, 1971, abandoned. This application Aug. 25, 1975, Ser. No. 607,416
Int. Cl.² A23J *3/00*
U.S. Cl. 426—656 **21 Claims**

9. An edible protein product comprising an expanded proteinaceous material, said product having an open, cellular, fibrous structure and a fatty glyceride content of from 8.13% up to about 35% by dry weight and prepared by heat processing and mechanically working a composition containing an admixture of a proteinaceous material having a protein content of at least 30% by weight, from 0 to about 35% by dry weight of added fatty glyceride, between about 0.1 to about 20% by dry weight of a non-proteinaceous and non-farinaceous finely divided filler material capable of binding up fatty glyceride, and 0.01 to 2.5% by weight of sulfur or a sulfur compound, said filler comprising microcrystalline cellulose or cellulose fiber or floc.

4,031,268
PROCESS FOR SPRAYING METALLIC PATTERNS ON A SUBSTRATE

Thomas E. Fairbairn, Westland, Mich., assignor to Sirius Corporation, Toledo, Ohio

Filed Jan. 5, 1976, Ser. No. 646,226
Int. Cl.² B05D *1/10*
U.S. Cl. 427—12 **5 Claims**

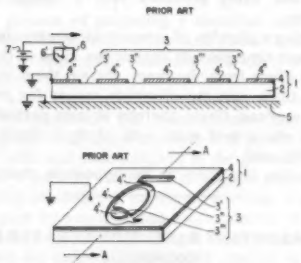


1. In a method of spraying metallic patterns such as conductors of an electrical circuit onto a metallic supporting surface of a supporting base including cleaning and roughening the supporting surface; spraying a powdered bonding material onto the supporting surface by means of the flame spray process; spraying a powdered ceramic insulation layer onto the supporting surface by means of the flame spray process; and applying a self-supporting template to the ceramic-coated supporting surface, said template conforming the desired configuration of the electrical circuit conductors; the improvement comprising: spraying a powdered electrically conductive material through said template and onto said ceramic-coated surface by means of the flame spray process with a spray gun having a powder feed orifice and simultaneously apply a low amperage high voltage A.C. signal between the powder feed orifice of said gun and said metallic supporting surface; whereby an electrical circuit corresponding to the configuration of said template is formed on top of said ceramic-coated surface, with said ceramic coating insulating said current conductors from said metallic supporting surface.

4,031,269
ELECTROSTATIC IMAGE FORMING METHOD

Isoji Takahashi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 25, 1974, Ser. No. 482,869
Claims priority, application Japan, June 25, 1973, 48-72021
Int. Cl.² G03G *13/00*
U.S. Cl. 427—24 **10 Claims**



1. An electrostatic image forming method comprising:

uniformly charging with corona discharge a first surface of an electrostatic image forming member comprising an electrically insulating support having a surface resistance greater than about $10^{12}\Omega/cm^2$ and a conductive layer having a surface resistance less than about $10^{8}\Omega/cm^2$ disposed on said insulating support, said layer having open portions which form a pattern therein and expose the recessed surface of said insulating support member, said support member comprising the only support for said conductive layer where an optional insulative intermediate layer may be disposed between said conductive layer and said support member, the pattern formed in said conductive layer resulting in conductive layer portions completely surrounded by recessed surface portions of said insulating support, the uniform charging being such that all conductive layer portions are electrically isolated from the earth during the charging so that the surfaces of all said conductive layer portions and said recessed surface portions of said insulating support are uniformly charged; and

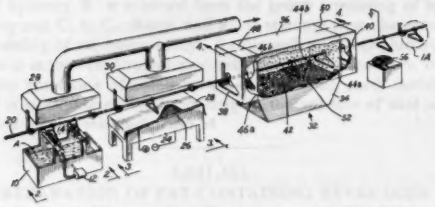
subsequently grounding the surfaces of all of the charged conductive layer portions to the earth by connecting said last-mentioned portions to earth by an electrical conductor so as to remove the charges therefrom so that the charges in the said recessed surface portions of the insulating support remain as an electrostatic latent image.

4,031,270

METHOD OF FLOCKING METAL ARTICLES

Tracy W. Barnes, Peoria, Ill., assignor to Laidlaw Corporation, Peoria, Ill.

Continuation of Ser. No. 477,796, June 10, 1974, abandoned, which is a division of Ser. No. 314,138, Dec. 11, 1972, Pat. No. 3,850,659. This application June 2, 1975, Ser. No. 582,912
The portion of the term of this patent subsequent to Dec. 18, 1990, has been disclaimed.
Int. Cl.² B44C 1/08; B05B 5/02; B44D 1/092
U.S. Cl. 427—27 7 Claims



1. A method for distributing and charging a flock material within an enclosure in order to apply said material to an electrically charged, adhesive coated coat hanger suspended in said enclosure comprising the steps of:

a. providing an enclosure containing a mass of flock material fibers with a mass surface and electrode means for imparting an electrostatic charge of a first polarity to said fibers, said hanger being suspended above the mass surface and being provided with a charge of opposite polarity,

b. directing a plurality of separate air streams intermittently for short time periods against the mass of flock material to lift fibers from the mass, entrain them in the air and carry them past the electrode means for imparting the charge of said fibers, thereby at least partially filling the space above said mass with charged fibers of the first polarity, and

c. depositing the fibers on the oppositely charged hanger.

4,031,271

ALKALI-RESISTANT RADIATION CURABLE ENE-THIOL COMPOSITIONS

Richard Wayne Bush, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

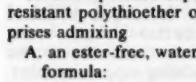
Filed Nov. 17, 1975, Ser. No. 632,326
Int. Cl.² B05D 3/06
U.S. Cl. 427—43 6 Claims

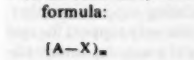
1. A composition capable of forming a solid, cured, alkali-resistant polythioether on exposure to radiation which comprises admixing

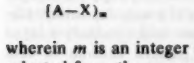
A. an ester-free, water insoluble polyene component of the formula:

$$[A-X)_m$$

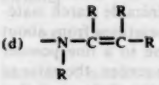
wherein m is an integer of at least 2, wherein X is a member selected from the group consisting of:

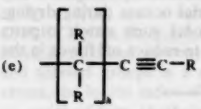
(a) 

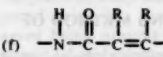
(b) 

(c) 

-continued

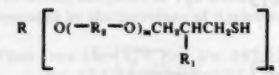
(d) 

(e) 

(f) 

where h is an integer from 1 to 9; R is a radical selected from the group consisting of hydrogen, fluorine, chlorine, furyl, thienyl, pyridyl, phenyl and substituted phenyl, benzyl and substituted benzyl, alkyl and substituted alkyl, alkoxy and substituted alkoxy, cycloalkyl and substituted cycloalkyl; said substituents on said substituted members selected from the group consisting of nitro, chloro, fluoro, acetoxy, acetamide, phenyl, benzyl, alkyl, alkoxy and cycloalkyl; said alkyl and alkoxy having from one to nine carbon atoms and said cycloalkyl having from three to eight carbon atoms; wherein [A] is free of reactive carbon-to-carbon unsaturation; and is a polyvalent chemically compatible member of the group consisting of carbonyl, ether, silane, silicate, phosphonate, phosphite, phosphate, alkyl and substituted alkyl, cycloalkyl and substituted cycloalkyl, aryl and substituted aryl, urethane and substituted urethane, urea and substituted urea, amine and substituted amine, amide and substituted amide, heterocyclic carbon containing radical, and mixtures thereof; said substituents on said members being defined above, said component having a molecular weight in the range from about 64 to 20,000; and a viscosity in the range from essentially 0 to 20 million centipoises at 70° C; and

B. polythiol of the formula



where R is an aliphatic hydrocarbon moiety containing 2–6 carbon atoms, R_2 is an alkylene group containing 2–6 carbon atoms, R_1 is hydrogen or —OH, n is 2–6, and m is 1–2.

4,031,272

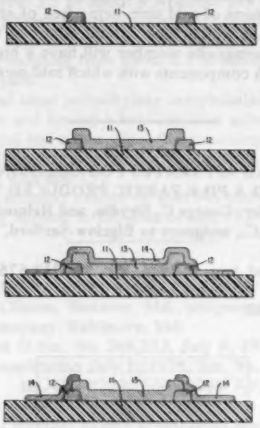
HYBRID INTEGRATED CIRCUIT INCLUDING THICK FILM RESISTORS AND THIN FILM CONDUCTORS AND TECHNIQUE FOR FABRICATION THEREOF

Satya Pal Khanna, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1975, Ser. No. 576,100
Int. Cl.² H01C 7/00; B05D 5/12
U.S. Cl. 427—96 3 Claims

1. Technique for fabricating a hybrid integrated circuit including the steps of successively depositing a thick film resistor and thin film conductive metallization upon a sub-

strate characterized in that gold tabs are deposited upon the substrate by screen printing of a gold paste and subsequent



firing prior to deposition of the thick film resistor, the gold tabs serving as resistor termination pads.

4,031,273

CONTINUOUS PROCESS FOR OPTICAL BRIGHTENING

Gerhard Reinert, Allschwil, Switzerland; Jack Fallows, Shaw Oldham, England, and Paul Dussy, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,398

Claims priority, application Switzerland, Sept. 3, 1974, 11947/74

Int. Cl.² D06M *1/14, 1/22*

U.S. Cl. 427—158 **14 Claims**

1. Process for the continuous optical brightening of synthetic polyamide fiber material from organic solvents, wherein

a. the fiber material is dry cleaned,

b. at least one ionic optical brightener is applied to the material from a solution, emulsion or dispersion in a non-polar organic solvent,

c. the material is dried,

d. the optical brightener is treated with hot aqueous acid, and

e. the fiber material is subsequently heat-treated.

4,031,274

METHOD FOR COATING CAVITIES WITH METAL

Irwin I. Bessen, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Oct. 14, 1975, Ser. No. 622,376

Int. Cl.² C23C *3/04*

U.S. Cl. 427—229 **9 Claims**

1. In a method for coating an article having an outer surface and a cavity within the article, communicating with the outer surface through a relatively small diameter opening and having a metallic inner surface, the steps of:

contacting the inner surface with a fluid comprising at least one organic compound including at least one metal selected from the group consisting of Al, Cr, Ni and their alloys and mixtures by flowing the fluid through the cavity and the small diameter opening, the compound being capable of decomposition to provide the metal; while

heating the inner surface at a first temperature to enable said decomposition to occur and to provide a metal deposit on the inner surface,

heating the deposit in a non-oxidizing atmosphere at a second temperature for a time sufficient to remove volatile materials from the deposit; and then,

rapidly increasing the temperature of the inner surface and of the deposit to a third temperature in the range of about 870° – 1100° C. within a period of up to about 30 minutes and heating in that range for a time sufficient to interdiffuse the deposit and the inner surface to provide an inner surface coating.

4,031,275

LOW TEMPERATURE VAPOR SEALING OF ANODIZED ALUMINUM

Andrew Alexander, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 22, 1975, Ser. No. 642,894

Int. Cl.² C25D *11/24*

U.S. Cl. 427—248 R **7 Claims**

1. A method of forming a low temperature seal on anodized aluminum which comprises exposing said anodized aluminum to ammonia vapors to provide a seal thereto such that immersing said sealed anodized aluminum for a period of 15 minutes in a solution containing 2.0 wt.% chromic and 3.5 wt.% phosphoric acid at a temperature of 100° F produces a weight loss of not more than 2 mg./in.².

4,031,276

PREPARATION OF DENSIFIED WOOD IMPREGNATED WITH PHENOLIC RESINS

Nobutaka Nakamura, and Yukio Saeki, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed July 21, 1975, Ser. No. 597,618

Claims priority, application Japan, July 24, 1974, 49-84225

Int. Cl.² B05D *3/12, 3/02, 1/18*

U.S. Cl. 427—369 **10 Claims**

1. In the process of preparing a densified wood product wherein wood is contacted with a resole phenol-formaldehyde resin solution to impregnate the wood with said resin solution and thereafter is dried and then heated to fix and cure the resin in the wood, said solution comprising a condensate of phenol and formaldehyde, the improvement which comprises impregnating the wood under a pressure of about 10 to about 50 Kgs/cm² with said resin solution in the presence of about 0.6 to about 4 parts by weight of an organic liquid selected from the group consisting of methanol, acetone, and mixtures thereof per part by weight of the solids content of said resin solution whereby the bending strength of the wood product is increased and the cured phenolic resin content of the wood product is enhanced.

4,031,277

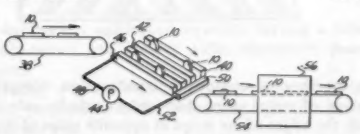
METHOD OF COATING METAL WITH VINYLIDENE CHLORIDE-VINYL CHLORIDE COPOLYMER

Tull C. Lasswell, 230 Pawnee Path, Lake Orion, Mich. 48035, and John L. Monier, 1968 Harwood Drive, Oxford, Mich. 48051

Continuation-in-part of Ser. No. 195,508, Nov. 3, 1971, abandoned, which is a division of Ser. No. 851,261, Aug. 19, 1969, Pat. No. 3,635,369. This application Aug. 12, 1974, Ser. No. 496,375

Int. Cl.² B05D *3/02*

U.S. Cl. 427—388 R **11 Claims**



1. The method of providing a surface of a metallic part with a dry pliable coating, said method consisting of applying at room temperature to said surface of said metallic part a liquid solution consisting of vinylidene chloridevinyl chloride co-

polymer powder and a solvent for forming on said surface a wet coating of said solution, and of subsequently heating said metallic part at a temperature in the range of 160° F (71° C) to 250° F (121° C) for a time period of 20 to 10 minutes, wherein the solvent is selected from the group consisting of methyl-ethyl-ketone and cyclohexanone, the ratio by weight of the vinylidene chloride-vinyl chloride copolymer to the solvent is between one to one and one to two and the thickness of the resulting dry coating on the surface of said metallic part is comprised between 1 mil (25 microns) and 6 mils (150 microns) and is directly proportional to the concentration of vinylidene chloride-vinyl chloride copolymer in said solution and to the heating temperature and inversely proportional to the heating time duration.

4,031,278

HIGH HARDNESS FLAME SPRAY NICKEL-BASE ALLOY COATING MATERIAL

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,549
Int. Cl.² B05D *1/08*
U.S. Cl. 427—423 **8 Claims**

1. A metal spray powder blend characterized by the property of forming a dense coating on a metal substrate consisting of,

particles of a nickel-base alloy powder intimately mixed with aluminum powder, a major portion of said nickel-base alloy powder having an average particle size falling within the range of about −100 mesh to +325 mesh,

said nickel-base alloy powder containing by weight about 2.5 to 20% Cr, 0.5 to 6% Si, 0.5 to 5% B, up to about 1% C, up to about 10% Fe and the balance essentially nickel,

said aluminum mixed with said nickel-base alloy powder having a particle size less than 15 microns and ranging by weight from about 0.5 to 5% of the total mixture and being in intimate association with the surface of the particles of said nickel-base alloy,

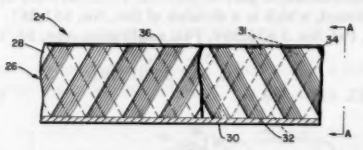
the ratio of average particle size of said nickel-base powder to the average particle size of said aluminum powder being over 5:1.

4,031,279

COMPOSITE CONSTRUCTION OF METALLIC STRIPS DISPOSED IN SIDE-BY-SIDE RELATIONSHIP

George D. Cremer, Lemon Grove, and John V. Long, El Cajon, both of Calif., assignors to International Harvester Company, San Diego, Calif.

Continuation-in-part of Ser. No. 335,320, Feb. 23, 1973, Pat. No. 3,916,054. This application June 30, 1975, Ser. No. 591,830
Int. Cl.² B32B *3/10, 3/12, 3/28*; E04B *2/28*
U.S. Cl. 428—44 **13 Claims**



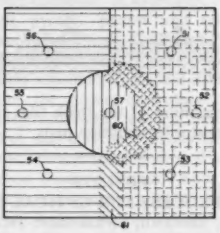
1. A member of composite construction comprising an assemblage of metal strips disposed in side-by-side relationship with the edges of the strips at opposite sides of the assemblage and those edges of the strips at one side of the assemblage being exposed and defining a working surface; means formed in said strips for providing interstices therebetween; and means for maintaining the strips in the assemblage in the aforesaid relationship, those portions of the metal strips including the edges thereof on one side of said assemblage being folded and extended toward an adjacent strip of the assemblage to thereby increase the continuity and smoothness of the working surface presented by said one side of said assemblage, said folded portions of said strip being free of attachment to the strips toward which they extend whereby the working surface of the composite member will have a high degree of compliance with components with which said member is associated.

4,031,280

METHOD AND APPARATUS FOR COLORING A PILE FABRIC, AND A PILE FABRIC PRODUCED THEREBY

John V. C. Weller; George C. Strydio, and Helmuth Vits, all of Greenville, S.C., assignors to Bigelow-Sanford, Inc., Greenville, S.C.

Filed Aug. 9, 1976, Ser. No. 712,675
Int. Cl.² B41F *15/04*
U.S. Cl. 428—88 **6 Claims**



1. In a process for the application of color designs to pile fabrics including introducing determined amounts of liquid color materials, at spaced apart points, into a receptacle having at least one resilient barrier for defining color transistions and positioned between a pair of said points, and then pressing the pile face of the pile fabric into the receptacle, whereby the color materials in the receptacle impregnate the pile fabric to provide a color design in the pile fabric; the improvement wherein said step of introducing color materials into said receptacle comprises introducing first and second liquid color materials of different color into said receptacle at first and second adjacent points respectively between which said flow of liquid materials is not inhibited by said resilient barrier, whereby said first and second liquid materials intermix in a region between said first and second points to color the portion of said pile fabric pressed into said region with a color that is a blend of the colors of said first and second liquid materials.

5. A multi-colored pile fabric having on its pile face first and second adjacent colored regions of different color that are sharply defined at the boundary therebetween, and third and fourth adjacent regions of different color, the colors of said third and fourth regions being intermixed and blended in a multitude of shades of blending of the colors of said third and fourth regions and between said third and fourth regions.

4,031,281

FLOCKED METALLIC LAMINATED WALLCOVERINGS

Ronald James Keeling, Cincinnati, Ohio, assignor to Formica Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 619,094, Oct. 2, 1975, abandoned. This application Sept. 21, 1976, Ser. No. 725,053
Int. Cl.² B32B *3/02, 33/00*
U.S. Cl. 428—90 **10 Claims**

1. A thermally and dimensionally stable wallcovering, weighing from about 6.0 to about 11.8 ounces per square yard, comprising, in superimposed relationship,

1. a woven or non-woven cellulosic or synthetic fabric weighing from about 0.5 to about 1.4 ounces per square yard,

2. a calendered coating atop said fabric of a filled vinyl chloride/-vinyl acetate copolymer, said coating weighing from about 3.5 to about 4.5 ounces per square yard,
3. a clear adhesive coating, atop said calendered coating, of a vinyl chloride/vinyl acetate copolymer, said adhesive coating weighing from about 0.2 to about 0.4 ounces per square yard,
4. a film of clear polyethylene terephthalate, metalized on one side and having a heat-sensitive adhesive coating on said metal and a thin, clear thermosetting polyester coating on the other side thereof, said metalized side being in contact with said (3),
5. a vinyl adhesive coated on said (4) and
6. flocking applied to the area of said (5).

4,031,282

SIMULATED TRADITIONAL SAND-FINISHED MASONRY

John L. McClinton, Hanover, Md., assignor to The Burns & Russell Company, Baltimore, Md.

Continuation of Ser. No. 269,213, July 5, 1972, abandoned. This application July 1, 1975, Ser. No. 592,356

Int. Cl.² B32B *3/00;* **B05D** *3/12*

U.S. Cl. 428—141 **24 Claims**

1. A panel member having a simulated traditional colonial sand-finished masonry appearance, with the characteristic rugged, roughened, unmolded and uncast surface, which surface is extremely hard, water-repellent and permanent but permits diffusion of moisture; said surface being applied to a porous substrate and consisting of a thin, pressure smeared coating of a composition comprising a cured thermosetting ethylenically unsaturated alkyd resin, a cured polymerizable vinyl monomer, and at least 50% by weight of sand as a finely-divided filler; said sand filler being treated with between about 0.01% and 2% by weight of an alkylene substituted silane or siloxane of the formula:

$$R_xSiX_{(4-x)}$$

in which R is an unsaturated group, X is a group which reacts with sand or moisture, and x is a whole number from 1 to 3; and said porous substrate comprising one or more materials selected from the group consisting of cinders, slag, concrete, haydite, clay, sand, sandlime, gasbetone, gravel, and cement.

4,031,283

POLYTETRAFLUOROETHYLENE FELT

Joseph P. Fagan, Huntington, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 633,837, Nov. 20, 1975, abandoned. This application Mar. 23, 1976, Ser. No. 669,602

Int. Cl.² D04H *1/44*

U.S. Cl. 428—280 **4 Claims**

1. A felt-like article comprised of filamentary polytetrafluoroethylene characterized by

a. predominantly horizontal coplanar superimposed layers of filamentary polytetrafluoroethylene components interrupted by occasional interlayered orientation, and
b. fibrils of polytetrafluoroethylene criss-crossing interstices of the felt-like article;

Wherein the article has a filter efficiency greater than 95% and an air porosity, measured at 0.5 inch W.G., of greater than 45 cubic feet per minute.

4,031,284

INSULATED AND GROUNDED FENCE FABRIC

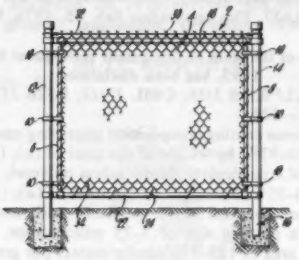
Glen E. Ingraham, Lebanon, N.J., assignor to Colorguard Corporation, Raritan, N.Y.

Filed June 2, 1975, Ser. No. 582,834

Int. Cl.² D03D *15/02;* **A01K** *3/00;* **E04H** *17/04;* **B21F** *27/00*

U.S. Cl. 428—222 **14 Claims**

1. In a fence fabric construction formed of a plurality of individually coated wires each composed of a metal core enveloped by a heat-distintegrable electrically non-conductive coating, adjoining pairs of said coated wires being engaged at, at least, one point along their length, the improvement that comprises an elongated metal conductor element permanently interlocked by, and defining a passage through, each of said adjoining pairs of coated wires at the point of engagement



thereof with each other; said conductor element being disposed in electrical connection with the metal cores of each of said adjoining coated wires at each if said points of engagement.

4,031,285

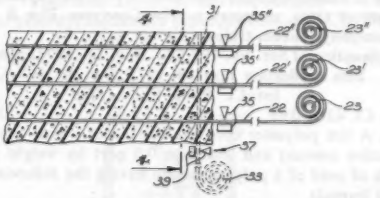
LIGHTWEIGHT, REINFORCED FOAMED ORGANIC POLYMER AND CEMENTITIOUS MATERIAL STRUCTURE

Charles H. Miller, 54-065 Avenida Carranza, La Quinta, Calif. 92253, and Jose A. Mayrl, Centenario 1222 San Pedro Garza Garcia, N. Leon, Mexico

Division of Ser. No. 191,276, Oct. 21, 1971, Pat. No. 3,878,278. This application Dec. 16, 1974, Ser. No. 532,974

Int. Cl.² B32B *3/26*

U.S. Cl. 428—294 **14 Claims**



1. A lightweight reinforced structure having a substantial length dimension and greater width dimension than depth dimension,

comprising; a mixture obtained as a result of foaming organic polymer material insitu throughout cementitious material; and

at least one elongate reinforcing member embedded in said mixture intimately joined thereto under tension and gripped by said material substantially along its entire length, said elongate member being elongate in said length direction and relatively rigid in the depth dimension of said mixture.

4,031,286

FLUOROCARBON POLYMER COATING COMPOSITIONS CONTAINING MICA PARTICLES

Herman Ernest Seymus, Lint, Belgium, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 400,040, Sept. 24, 1973, Pat. No. 3,970,627. This application Feb. 25, 1976, Ser. No. 661,331

The portion of the term of this patent subsequent to July 20, 1993, has been disclaimed.

Int. Cl.² B32B 5/16; C08L 27/18; B32B 15/08

U.S. Cl. 428—324 7 Claims

1. An aqueous coating composition consisting essentially of:

a. about 40–93%, by weight of the total of (*a*), (*b*) and (*c*) solids, of a particulate fluorocarbon polymer,

b. about 5–35%, by weight of the total of (*a*), (*b*) and (*c*) solids, of colloidal silica stabilized with sodium ions, having a particle size of 7–25 millimicrons, a specific surface area of 125–420 square meters per gram, a silica content of 30–50% by weight, and a pH of 8.4–9.9 at 25° C., or a mixture of said silica with water-soluble alkali metal silicate, in a ratio in the range between 75:25 and 10:90 by weight respectively,

about 2–25%, by weight of the total of (*a*), (*b*) and (*c*) solids, of irregularly shaped mica platelets 80% of which are 0.05–0.15 micron thick and 4–50 microns wide (longest dimension) and

d. water as a carrier.

5. An article bearing a fused coating of the composition of claim 1.

4,031,287

SELF-BONDING INSULATED WIRE

Kazuo Suzuki; Yoshiaki Hayashi, and Seiichi Nagamine, all of Ootsu, Japan, assignors to Kanegafuchi Chemical Industries Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 349,885, April 10, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 569,330

Claims priority, application Japan, Apr. 13, 1972, 47-37529

Int. Cl.² B32B 15/00; B05D 3/02

U.S. Cl. 428—379 10 Claims

1. A self-bonding insulated wire which comprises an electro-conductive wire and a varnish composition containing 100 parts by weight of a copolyamide and 10 to 25 parts by weight of a thermoplastic linear polyhydroxypolyetherester resin coated thereon.

4,031,288

BONDING TIRE CORD TO RUBBER

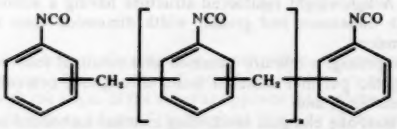
Roop S. Bhakuni, Copley, and Grover W. Rye, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 197,942, Nov. 11, 1971, abandoned. This application June 18, 1975, Ser. No. 587,938

Int. Cl.² B29H 9/02, 17/28

U.S. Cl. 428—395 12 Claims

1. A tire polyester cord the surface of which contains an effective amount and less than 0.5 part by weight per 100 parts of cord of a polyisocyanate having the following structural formula



where *n* is greater than 1.2 and has a Brookfield viscosity measured at 25° C. using a No. 3 spindle revolving at 250 rpm of at least 1000 cps, said polyisocyanate being deposited from a solvent solution thereof as a first treatment and deposited thereon a second coating containing the addition product of a polyisocyanate and a water-soluble thermoplastic resin resulting from the reaction of an formaldehyde and a resorcinol, a resinous reaction product of a resorcinol and an formaldehyde and a rubber latex.

4,031,289

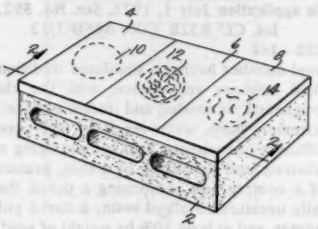
STAIN RESISTANT POLYESTER-COATED BLOCK

John A. Sergovic, Severna Park, Md., assignor to The Burns & Russell Company of Baltimore City, Baltimore, Md.

Filed May 11, 1976, Ser. No. 685,254

Int. Cl.² B32B 13/12, 5/16, 27/36

U.S. Cl. 428—451 32 Claims



1. In a cast article of a cured resinous composition of an ethylenically-unsaturated polymerizable polyester resin and sand particles, said sand particles comprising at least about 50% by weight of said composition, and in which said sand particles and cured resin are bonded to one another by a bonding agent comprising an unsaturated silane also having attached to the silicon a group which reacts with the hydroxyl groups present in sand or moisture present in the surface of sand, and wherein the resinous composition also comprises styrene, p-methyl styrene, methyl methacrylate, vinyl acetate, diallyl phthalate, cyclopentadiene or ethyl acrylate as a polymerizable solvent, the improvement comprising employing as the polyester resin, a polyester made from a glycol component consisting of neopentyl glycol, or a mixture of neopentyl glycol, with up to 42 molar percent based on the total glycol of a glycol selected from the group consisting of propylene glycol, ethylene glycol and diethylene glycol, and a component consisting of isophthalic acid and maleic anhydride, the maleic anhydride being 10 to 33% of the total polyester resin by weight, said cast article having improved stain resistance.

6. In a masonry unit having an integral molded facing layer of a cured resinous composition of an ethylenically-unsaturated polymerizable polyester resin and sand particles, said sand particles comprising at least about 50% by weight of said composition and in which said sand particles and cured resin are bonded to one another by a bonding agent comprising an unsaturated silane also having attached to the silicon a group which reacts with the hydroxyl groups present in sand or moisture present in the surface of sand, and wherein the resinous composition also comprises styrene, p-methyl styrene, methyl methacrylate, vinyl acetate, diallyl phthalate, cyclopentadiene or ethyl acrylate as a polymerizable solvent, the improvement comprising, as the polyester resin, a polyester made from a glycol component consisting of neopentyl glycol or a mixture of neopentyl glycol with up to 42 molar percent based on the total glycol of a glycol selected from the group consisting of propylene glycol, ethylene glycol and diethylene glycol, and a component consisting of isophthalic acid and maleic anhydride, the maleic anhydride being 10 to 33% of the total polyester resin by weight, said masonry unit having improved stain resistance.

4,031,290

MERCAPTAN BLOCKED THERMOSETTING COPOLYMERS

Carl Clement Anderson, Menomonee Falls, Wis., and Rostyslaw Dowbenko, Bigsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 248,846, May 1, 1972. This application Sept. 20, 1976, Ser. No. 724,900

Int. Cl.² C08F 28/02; C08L 67/06, 67/08

U.S. Cl. 428—480 13 Claims

1. A polymer prepared by the process comprising:

a. reacting

1. a polyester and

2. a mercaptan comprising an organic compound containing an —SH group and another group which is reactive with said polyester

to provide a mercapto-terminated reaction product;

b. reacting said mercapto-terminated reaction product with one or more ethylenically unsaturated monomers in the presence of a peroxygen or azo catalyst to form said polymer.

4,031,291

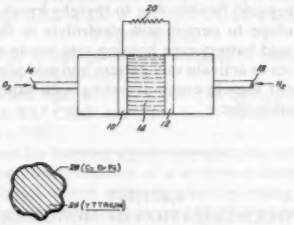
HYDROGEN-OXIDIZING CATALYST, AND FUEL CELL ELECTRODE USING SAME

Malcolm A. Fullenwider, Whitehall, Pa., assignor to Malcolm A. Fullenwider and Richard L. Ament, II, both of Allentown, Pa.

Filed Apr. 5, 1976, Ser. No. 673,670

Int. Cl.² H01M 4/86, 4/94

U.S. Cl. 429—40 15 Claims



1. A hydrogen-oxidizing catalyst, comprising a body of yttrium having thereon a thin surface layer of copper or platinum.

4,031,292

METHOD FOR THE PREPARATION OF AN ELECTROCATALYST

George L. Hervert, Woodstock, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 19, 1976, Ser. No. 678,003

Int. Cl.² H01M 4/00

U.S. Cl. 429—40 15 Claims

1. A method for the preparation of an electrocatalyst which comprises treating a refractory inorganic oxide with a pyrolyzable organic compound at pyrolysis conditions to form at least a monolayer of a carbonaceous pyropolymer on the surface of said refractory inorganic oxide, thereafter impregnating the resulting composite with a complex of a soluble salt of at least one catalytically active metal and a sulfur-containing carboxylic acid, heating the impregnated composite to a temperature sufficient to remove the solvent, reducing the dried composite and recovering the resultant electrocatalyst.

4,031,293

MAINTENANCE FREE LEAD STORAGE BATTERY

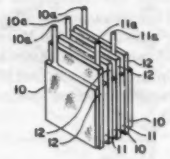
Ernst Voss, Niederhofheim, and Heinrich Rabenstein, Flm.-Zeilsheim, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Feb. 20, 1976, Ser. No. 659,959

Claims priority, application Germany, Mar. 6, 1975, 2509779

Int. Cl.² H01M 10/14

U.S. Cl. 429—60 5 Claims



1. A maintenance-free lead storage battery having an electrode grid of lead or antimony-free lead alloy, a separator and sulfuric acid electrolyte in the pores of the separator and the active mass, and characterized in that

the weight of the negative active mass is less than 80% of the weight of the positive active mass, the quantity and concentration of the electrolyte is so proportioned that the acid density is no more than 1.07 grams per cm^3 after 20-hour current discharge; and comprising N negative electrodes and N+1 positive electrodes positioned in alternating positive and negative arrangement.

4,031,294

SPLASH-PROOF DEVICE FOR USE IN A STORAGE BATTERY

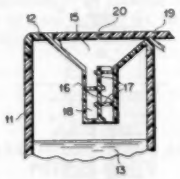
Ichiro Sano, Yokohama, Japan, assignor to The Furukawa Battery Co., Ltd., Yokohama, Japan

Filed Feb. 25, 1976, Ser. No. 661,266

Claims priority, application Japan, Feb. 27, 1975, 50-26727

Int. Cl.² H01M 2/12

U.S. Cl. 429—82 6 Claims

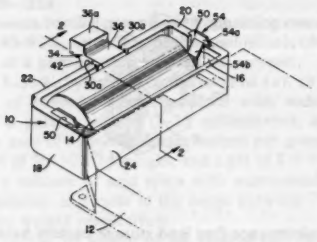


1. A splash-proof device for use in a storage battery comprising a cylindrical member provided in a cell cover of a storage battery integrally therewith and open at its bottom with a diameter of the resulting opening being equal to the inner diameter of the cylindrical member, and at least one helical splash-proof baffle having a width equal to at least ½ of the inner diameter of the cylindrical member, said baffle provided inside said cylindrical member.

4,031,295
COMBINATION HOUSING WITH COMPARTMENT AND EJECTOR MECHANISM FOR EJECTING A BATTERY THEREFROM

Anthony W. Rigazio, Oglesby, Ill., assignor to General Time Corporation, Thomaston, Conn.

Filed Mar. 11, 1976, Ser. No. 665,793
Int. Cl.² H01M 2/10
U.S. Cl. 429—100 5 Claims

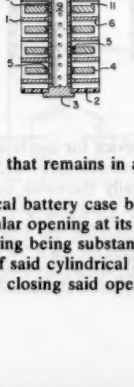


1. In combination a housing and an ejection means adapted for ejection of a battery from a seated position in a compartment within said housing, said compartment formed by a plurality of side walls and a bottom wall which surround closely and substantially encase said battery, said ejection means including a member substantially of Z-shaped outline having first and second lever arms and a pivot axis therebetween, said pivot axis comprised of a hinge formed integral with one of said walls and said member and in the region of the entrance to said compartment, both said one wall and bottom wall having a cutout, said first lever arm extending from said hinge within said cutouts and terminating below said battery whereby upon pivot movement of said member said first lever arm moves within said cutout into the area of said compartment for ejection of said battery, and said second lever arm having a finger engaging surface laterally removed from said compartment.

4,031,296
ELECTROCHEMICAL ENERGY CELL

Robert I. Sarbacher, Marina Del Ray, and John C. Bogue, Santa Monica, both of Calif., assignors to John C. Bogue, Santa Monica, Calif.

Continuation of Ser. No. 358,896, May 10, 1973, abandoned. This application Aug. 11, 1975, Ser. No. 603,786
Int. Cl.² H01M 6/36
U.S. Cl. 429—116 10 Claims



1. A reserve battery that remains in an inactive state until activated comprising:

a. a hollow cylindrical battery case being open at one end and having a circular opening at its other end, the axis of said circular opening being substantially coincident with the vertical axis of said cylindrical battery case;

b. an insulating disc closing said open end of said battery case, said insulating disc having a circular opening in substantially the center thereof;

c. a perforated hollow anode cylinder located inside said battery case, the vertical axis of said anode cylinder being substantially coincident with the vertical axis of said battery case and the axis of said circular opening of said insulating disc;

d. a plurality of anode electrodes surrounding said anode cylinder and electrically secured thereto, said plurality of anode electrodes being spaced apart along the length of said anode cylinder;

e. a plurality of cathode electrodes surrounding said anode cylinder, said cathode electrodes being electrically connected to said battery case, said plurality of cathode electrodes being spaced along the length of said anode cylinder in such a manner that said plurality of anode electrodes and said plurality of cathode electrodes are alternately spaced along the length of said anode cylinder;

f. a substantially cylindrical shaped anode terminal secured to said insulating disc and to one end of said anode cylinder, the other end of said anode cylinder being unsecured, said anode terminal covering said opening in said insulating disc;

g. a frangible envelope containing an electrolyte, said frangible envelope being located inside said battery case adjacent said other end of said battery case;

h. a flexible disc having a gas vent in substantially the center thereof, said flexible disc being secured to said other end of said battery case to close said circular opening in said other end of said battery case;

i. a gas valve located over said gas vent in said flexible disc, said gas valve being free to move under pressure from gas generated inside said battery case to permit gas to escape through said gas vent in said flexible disc; and

j. a spring biased plunger secured to said flexible disc for depressing said flexible disc to thereby break said frangible envelope to permit said electrolyte to flow into the area of said battery case housing said anode and cathode electrodes to activate said battery and said plunger having a gas vent therein communicating with said gas vent in said flexible disc.

4,031,297
POLYMERIZATION OF MONOMERS

Edwin Studley Smith, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 281,903, Aug. 18, 1972, which is a continuation of Ser. No. 881,870, Dec. 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 335,413, Jan. 2, 1964, abandoned. This application Aug. 27, 1973, Ser. No. 391,905
Int. Cl.² C08F 2/02
U.S. Cl. 526—87 3 Claims

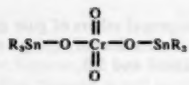
1. In a batch polymerization process for making a copolymer of uniform composition wherein a liquid mixture of polymerizable monomers is added to a reactor and a polymerization reaction commenced to form an initial volume of a polymerization medium comprised of (1) a liquid phase of the mixture of polymerizable monomers and (2) a solid phase of copolymer product and wherein the initial volume of the polymerization medium gradually decreases during the course of the polymerization reaction due to the copolymer being formed having a greater density than the polymerizable monomers being consumed, resulting in a final copolymer product of nonuniform composition, the improvement consisting of maintaining said initial volume of the polymerization medium constant throughout the polymerization reaction by continuously adding additional polymerizable monomers at that rate necessary to maintain said volume constant and in a ratio necessary to produce the desired copolymer of uniform composition.

4,031,298
POLYMERIZATION CATALYST AND METHOD

Thomas J. Pullukat, Hoffman Estates, Ill., assignor to Chemplex Company, Rolling Meadows, Ill.

Filed June 30, 1975, Ser. No. 591,942
Int. Cl.² C08F 4/02, 4/78, 10/00
U.S. Cl. 526—113 19 Claims

1. A catalyst for polymerizing one or more 1-olefins to an ultralow molecular weight and exceptionally broad molecular weight distribution, prepared by (1) forming a substantially dry intimate mixture of a finely divided support selected from the group consisting of silica, alumina, zirconia, thoria and mixtures thereof and an alkyl ester of titanium containing about 1–7 carbon atoms in the alkyl group in an amount to give about 1–10% of titanium on said support, (2) calcining said mixture from (1) to and at a temperature between about 400°–1000° C., (3) adding to the resulting calcined mixture from (2) an organotinchromate essentially of the formula



wherein each R is an individually selected hydrocarbon radical containing from 1–14 carbon atoms in an amount to give about 0.1–10% chromium in the final catalyst, and (4) activating the product from (3) by heating to and at a temperature between about 300°–500° C. in the presence of oxygen.

4,031,299
PROCESS FOR FORMING A POLYVINYL CHLORIDE EXTENDER RESIN BY INCORPORATING IN THE SUSPENSION POLYMERIZATION MEDIUM A PREHOMOGENIZED SOLUTION OF A POLYALLYL COMPOUND AND A LOW MOLECULAR POLYMER OF PROPYLENE

Chung H. Wei, Wilmington, Del., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 11, 1975, Ser. No. 567,328
Int. Cl.² C08F 4/00, 14/06, 114/06, 7/00
U.S. Cl. 526—193 11 Claims

1. A process for forming a polyvinyl chloride extender resin by suspension polymerization of a monomer charge containing vinyl chloride which comprises incorporating in the suspension polymerization medium an effective amount of (1) a pre-homogenized solution of a polyallyl compound selected from the group consisting of diallyl phthalate, diallyl ether, diallyl sulfide, diallyl oxalate, diallyl adipate, diallyl maleate, diallyl fumarate, triallyl cyanurate and triallyl phosphate and (2) of a low molecular weight polymer of propylene for controlling the rheological properties of the polyvinyl chloride resin.

4,031,300
HIGH MOLECULAR WEIGHT, HIGH UNSATURATION ISOBUTYLENE-CYCLOPENTADIENE COPOLYMERS

Warren A. Thaler, Matawan; Donald J. Buckley, Plainfield, both of N.J., and Joseph P. Kennedy, Akron, Ohio, assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 457,109, April 1, 1974, Pat. No. 3,928,297, which is a continuation-in-part of Ser. No. 151,038, June 8, 1971, Pat. No. 3,808,177. This application Nov. 13, 1975, Ser. No. 631,444
The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.
Int. Cl.² C08F 232/06
U.S. Cl. 526—308 2 Claims

1. A substantially gel-free copolymer consisting of a major portion of isobutylene and about 5 to about 40 mol % cyclopentadiene, said copolymers having a number average molecular weight of about 90,000 to 120,000.

4,031,301
MICRO PARTICLE GENERATION

George Vinansky, Jr., Dover, and Emmanuel A. Lucia, Marlton, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

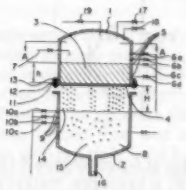
Filed Sept. 10, 1975, Ser. No. 612,052
Int. Cl.² B01J 2/04
U.S. Cl. 526—328 8 Claims

1. Process for generating micro particles comprising spraying one aerosal into another, the first aerosol containing solute dissolved in solvent conpletely, the second aerosol being a scavenger aerosol, said scavenger aerosol being a liquid exhibiting a greater chemical affinity for said solvent of said first aerosol than for said solute, said scavenger aerosol removing said solvent from said first aerosol thereby leaving behind said solute of said first aerosol as micro particles.

4,031,302
PROCESS FOR PREPARING GRANULAR RUBBER

Akihiko Shimizu, and Yasuhiro Sakanaka, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Sept. 25, 1975, Ser. No. 616,894
Claims priority, application Japan, Sept. 25, 1974, 49-110176
Int. Cl.² C08C 1/15; C08F 6/22
U.S. Cl. 528—486 6 Claims



1. A process for preparing granular rubber, which comprises:

allowing a latex mixture of a rubber latex and an aqueous solution of a high molecular weight polyanion containing carboxylate groups, hydroxyl groups or a mixture thereof to fall freely drop-wise for a distance of from 1 to 80 cm. into an aqueous solution of an alkaline earth metal salt; wherein:

a. from 2 to 8 parts by weight of said polyanion is admixed with 100 parts by weight of rubber in the rubber latex;

b. said latex mixture has a viscosity of from 200–8,000 cps; and

c. said aqueous solution of an alkaline earth metal salt has a concentration of from 1 to 10 wt. %;

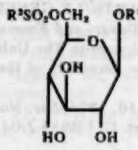
and recovering the granular rubber.

4,031,303
STERYL-β-D-GLUCOSIDE ESTERS AND METHOD OF PREPARATION

Hiromu Murai; Koji Kitaguchi; Tatsuo Suminokura; Akira Sano; Masahiro Kise; Masahiko Kitano, and Toshio Tomita, all of Kyoto, Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed Aug. 8, 1975, Ser. No. 603,110
Claims priority, application Japan, Aug. 14, 1974, 49-93621; Aug. 14, 1974, 49-93622
Int. Cl.² C07G 17/00
U.S. Cl. 536—5 4 Claims

4. A compound of the formula:



wherein

R^1 is selected from the group consisting of β-sitosteryl, campesteryl, stigmasteryl, and

R^2 is methyl, ethyl, phenyl, chlorophenyl, nitrophenyl or phenyl substituted with from 1 to 5 methyl groups.

4,031,304

PROCESS FOR PREPARING LINCOMYCIN DERIVATIVES

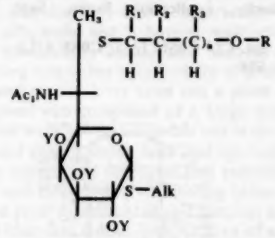
Brian Bannister, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 30, 1976, Ser. No. 653,938

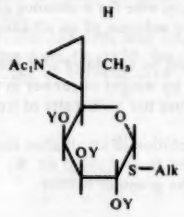
Int. Cl.² C07H *15/16*

U.S. Cl. 536—11 **18 Claims**

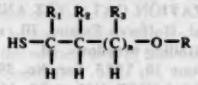
1. A process for making compounds of the formula:



wherein Alk is alkyl of not more than 4 carbon atoms; Ac_1 and Y is carboxacyl; R_1 is hydrogen, methyl or ethyl; R_2 is hydrogen, methyl or ethyl; R_3 is hydrogen, methyl or ethyl; n is 0 or 1; and R is hydrogen, alkyl of 1 to 6 carbon atoms, inclusive, or aralkyl of 7 to 12 carbon atoms, inclusive; which comprises heating at a temperature of from about 25° C. to about 180° C. ·ompound of the formula:



wherein Ac_1 and Y are carboxacyl; and Alk is alkyl of not more than 4 carbon atoms, with a thiol of the formula:



wherein R_1 is hydrogen, methyl or ethyl; R_2 is hydrogen, methyl or ethyl; R_3 is hydrogen, methyl or ethyl; n is 0 or 1; and R is hydrogen, alkyl of 1 to 6 carbon atoms, inclusive, or aralkyl of 7 to 12 carbon atoms, inclusive, in the presence of an anhydrous lower hydrocarbon carboxylic acid.

4,031,305

POLYGALACTOMANNAN ETHER COMPOSITIONS

Ronald N. DeMartino, Wayne, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,339

Int. Cl.² C08B *37/00*

U.S. Cl. 536—114 **3 Claims**

1. Sulfo-2-hydroxypropyl ethers of guar gum and the alkali metal and ammonium salts thereof having a degree of substitution between about 0.01 and 3.0.

4,031,306

POLYGALACTOMANNAN ALLYL ETHER COMPOSITIONS

Ronald N. DeMartino, Wayne, and Anthony B. Conciatori, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,519

Int. Cl.² C08B *37/00*

U.S. Cl. 536—114 **3 Claims**

1. Allyl ethers of guar gum having a degree of substitution between about 0.01 and 3.0.

4,031,307

CATIONIC POLYGALACTOMANNAN COMPOSITIONS

Ronald N. DeMartino, Wayne, and Anthony B. Conciatori, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed May 3, 1976, Ser. No. 682,286

Int. Cl.² C08B *37/00*

U.S. Cl. 536—114 **3 Claims**

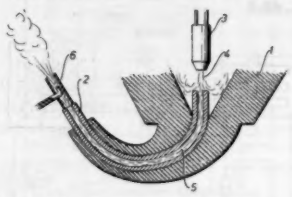
3. Quaternary ammonium ethers of polygalactomannan gum having a degree of substitution between about 0.01 and 3, wherein the quaternary ammonium ether substituents correspond to the formula:

wherein R is an alkyl group containing between one and about six carbon atoms, R_1 is an alkylene or alkenylene group containing between one and about six carbon atoms, and X is chlorine or bromine.

4,031,308
DIRECT CURRENT ARC FURNACE HEARTH CONNECTION INSTALLATION

Bengt Fredrickson, and Sven-Einar Stenkvist, both of Vasteras, Sweden, assignors to ASEA Aktiebolag, Vasteras, Sweden

Filed Mar. 31, 1976, Ser. No. 672,305
Claims priority, application Sweden, Apr. 1, 1975, 7503675
Int. Cl.² H05B *7/00*
U.S. Cl. 13—9 R **2 Claims**

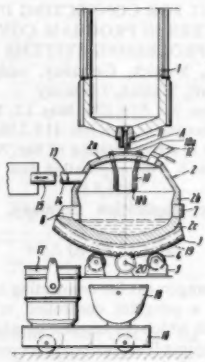


1. A method for drying a new hearth electrode installation of a DC electric arc furnace, the new installation comprising a metal billet extending through a wall portion of the furnace, the billet having an inside end which will be contacted by a melt in the furnace during operation of the furnace, and an outside end for an electrical connection, and at least slightly moist refractory surrounding the billet; said method comprising forming a hole lengthwise through the billet and passing hot gas through the hole to heat the billet until said refractory is substantially dried.

4,031,309
ARRANGEMENT FOR PRODUCING STEEL

Manfred Chitil, Essen-Frintrop, and Gotthard Hubatsch, Mulheimer (Ruhr), both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Oct. 22, 1975, Ser. No. 624,978
Claims priority, application Germany, Oct. 24, 1974, 2450495
Int. Cl.² F27D *3/10*
U.S. Cl. 13—10 **23 Claims**

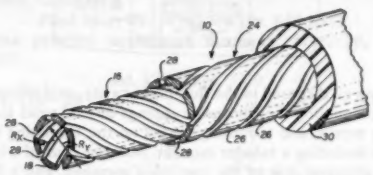


1. In a steel-producing installation, a combination comprising a support element; a container element including an upper region having an inlet opening, a middle region having outlet means, and a lower region bounding a depression for a body of materials to be treated; means for treating the body in said depression to obtain molten steel and slag; means for mounting said container element on said support element for tilting relative thereto about a horizontal axis located at said inlet opening, between a normal operating position and at least one tilted position in which slag and steel are respectively tapped through said outlet means, including at least one mounting member rigid with one of said elements and having a cam surface which has centers of curvature defining said axis, and cam follower means mounted on the other of said elements and operative for contacting and following said cam surface of said mounting member during the tilting of said container element between said positions thereof; and means for continuously introducing starting materials into said container element in a path which leads toward said body through said inlet opening in and inbetween said positions of said container element as a result of the location of said axis at said inlet opening, whereby the latter substantially retains its spatial position relative to said path during tilting of said container element.

4,031,310
SHRINKABLE ELECTRICAL CABLE CORE FOR CRYOGENIC CABLE

Ludwik Jachimowicz, Elizabeth, N.J., assignor to General Cable Corporation, Greenwich, Conn.

Filed June 13, 1975, Ser. No. 586,561
Int. Cl.² H01B *7/34, 12/00*
U.S. Cl. 174—15 C **9 Claims**



1. A cable core construction for a cryogenic electrical cable including in combination an inner metal strip having a helical lay of a predetermined angle and with successive convolutions spaced from one another, an outer metal strip having a helical lay with its angle of lay in the opposite direction and with successive convolutions spaced from one another, whereby the angle of lay of one strip is a right hand helix and the angle of lay of the other strip is a left hand helix, the outside surfaces of the convolutions of the inner strip being immediately adjacent to the inside surfaces of the convolutions of the outer strip for mutual support of one another, means fastening the inner and outer helixes to one another at both ends of the cable, and a plastic insulating jacket for the cable extending around the outside circumference of the outer helix.

4,031,311
ELECTRICAL BUSHING

Alfonso J. Mazanek, Hermitage, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 15, 1976, Ser. No. 666,809
Int. Cl.² H01B *17/26, 17/34*
U.S. Cl. 174—31 R **1 Claim**

1. A high temperature bushing assembly for interconnecting a high voltage direct current power supply and a hot precipitator in an ambient temperature up to 150° C, comprising:

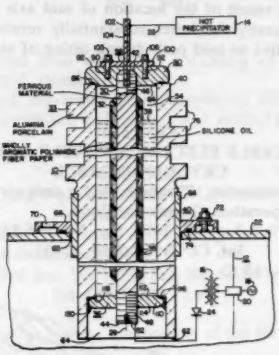
an elongated ceramic insulating member having first and second ends, and an opening which extends between its ends, said insulating member including Al_2O_3 in its formulation, to increase the electrical volume resistivity of said insulating member,

a single elongated metallic electrical conductor having first and second ends disposed coaxially within said insulating member, said electrical conductor being constructed of a ferrous material to provide a relatively low coefficient of thermal expansion,

first and second sealing means each including a gasket member associated with the first and second ends, respectively, of said electrical conductor, which cooperate with the first and second ends, respectively, of said insulating member to provide a fluid-tight cavity within said insulat-

ing member while allowing thermally induced dimensional changes in said ferrous electrical conductor and insulating member,

solid insulating means disposed about said electrical conductor intermediate its ends, said solid insulating means including a plurality of layers of fibrous overlying wrappings formed of wholly aromatic polyamide fibers,



silicone oil disposed in the fluid-tight cavity, said silicone oil impregnating the fibrous wrappings of said solid insulating means, and mounting means on the insulating member including a tubular metallic member coaxial with the longitudinal axis of the insulating member, and a flange member which extends perpendicularly outward from the tubular metallic member.

4,031,312

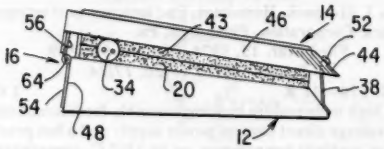
WEATHERPROOF ENCLOSURE FOR ELECTRICAL WIRING DEVICES

Allan Coleman, Highland Park, and Bernard Macklin, Rolling Meadows, both of Ill., assignors to Electrical Conductors, Inc., North Chicago, Ill.

Filed Aug. 14, 1975, Ser. No. 604,539

Int. Cl.² H05K *5/00*

U.S. Cl. 174—52 R **11 Claims**



1. A portable weatherproof enclosure comprising:

a housing;

a cover;

a spring-type hinge coupling the housing and the cover together enabling said cover to open and close upon said housing;

a gasket affixed to each of the housing and cover, wherein the gaskets are positioned within the housing and cover so that they will matingly abut each other when the cover and housing are in a closed position; and

a wiring device positioned within the housing, said wiring device being molded to an extension cord, and said extension cord passing between the gaskets of the cover and the housing.

4,031,313

PRINTED CIRCUITS WITH ARC-RETARDANCE

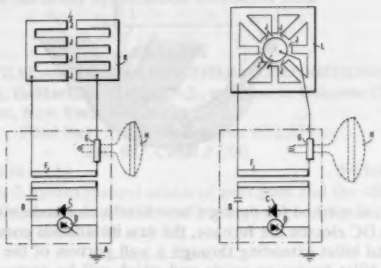
Arnold Franz, Troisdorf-Spich; Dirk Huthwelker, Troisdorf-Oberlar, and Lothar Jacob, Eckhausen, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Feb. 3, 1975, Ser. No. 546,810

Claims priority, application Germany, Feb. 1, 1974, 2404777; July 1, 1974, 2431447

Int. Cl.² H05K *1/00;* **B32B** *15/02*

U.S. Cl. 174—68.5 **9 Claims**



1. A laminated material comprising a substrate material containing resin-impregnated layers, and an electrically conductive metal foil having a thickness between 5 and 100μ disposed on said substrate and an arc-retardant layer having a high insulation resistance of more than 10^{12} ohms arranged between the metal foil and the substrate material, and said layer having a thickness of from 20 to 300μ and consisting essentially of from about 60 to about 100% by weight of a heat-stable cross-linked acrylic resin or ketone resin which is free of aromatic groupings or heterocyclic rings containing at least one hetero-atom and conjugated double bonds and which is not converted to a graphite-containing structure upon being thermally decomposed and up to 30% by weight of an epoxy resin, a phenolic resin or a melamine resin.

4,031,314

ARRANGEMENT FOR CONNECTING INFORMATION TRANSDUCERS IN PROGRAM CONTROLLED PROCESSING SYSTEMS

Hans Bittermann, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 576,276, May 12, 1975, abandoned, which is a continuation of Ser. No. 419,230, Nov. 27, 1973, abandoned, which is a continuation of Ser. No. 225,800, Feb. 14, 1972, abandoned. This application Jan. 5, 1976, Ser. No. 646,538

Claims priority, application Germany, Feb. 12, 1971, 2106730

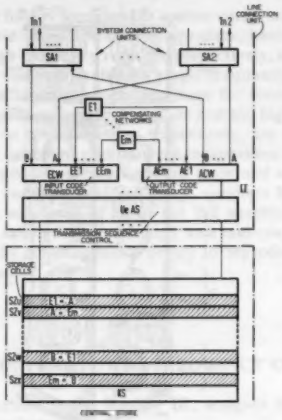
Int. Cl.² H04Q *3/54*

U.S. Cl. 178—3 **3 Claims**

1. A circuit arrangement for connecting information transducer means in a program controlled telecommunication switching system in which the transfer of information between incoming and outgoing line means occurs over a central memory, said line means being connected to a line connection unit, said central memory including a plurality of storage areas allocated to given incoming line means and accessible over input code transducers, each said storage area containing an address datum identifying an outgoing line means, each said outgoing line means being accessed, by means of said address datum, over an output code transducer, the circuit arrangement comprising:

a plurality of information transducer means having, respectively, input and output terminals, said input terminals being connected to outputs of said output code transducers, said output terminals being connected to inputs of said input code transducers,

each said information transducer means being identified by data accessible through an address contained in one of said storage areas allocated to an incoming connection through an incoming lines means,



the address identifying an outgoing connection being contained in the one of said storage areas allocated to the connected one of said information transducer means.

4,031,315

SOLID BODY IMAGE SENSOR HAVING CHARGE COUPLED SEMICONDUCTOR CHARGE SHIFT ELEMENTS AND METHOD OF OPERATION

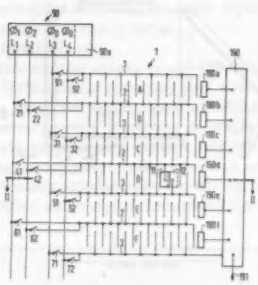
Hans-Jörg Pfleiderer, Zorneding, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 9, 1975, Ser. No. 611,624

Claims priority, application Germany, Sept. 27, 1974, 2446232

Int. Cl.² H04N 3/14; H01L 29/78, 27/14

U.S. Cl. 358—212 **2 Claims**



1. In an image sensor of the type having image elements arranged in a matrix, wherein each of the image elements comprises a first and a second electrode arrangement, wherein each of the image elements are photosensitive and the image elements form charge-coupled shift registers in rows, wherein all of the first electrode arrangements in each row are connected to a respective one of a plurality of first control lines and all of the second electrode arrangements of each row are connected to a respective one of a plurality of second control lines, wherein the two control lines of a row are connectible via switches to drive lines, wherein the switches are operated by drive registers, and wherein output coupling devices are provided for output coupling image information, the improvement for a single-phase mode of operation wherein:

each first control line is located between adjacent rows of image elements and is connected in common to each of said first electrode arrangements of the adjacent rows of image elements;

each second control line is located between the other adjacent rows of image elements and is connected in common to each of said second electrode arrangements of the other adjacent rows of image elements;

two pairs of drive lines each having two drive lines are provided; and

a plurality of switches is provided, respective switches connecting each of said first control lines to the two drive lines of a first pair of said two pairs of drive lines and connecting each of said second control lines to the two drive lines of a second pair of said two pairs of drive lines.

4,031,316

APPARATUS FOR THE TIME DIVISION MULTIPLEX TRANSMISSION OF BINARY SIGNALS

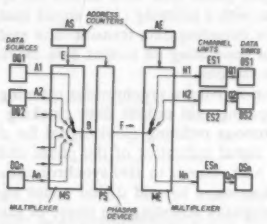
Konrad Reisinger, Zorneding, and Ludwig Hölzl, Sauerlach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 19, 1976, Ser. No. 668,521

Claims priority, application Germany, Mar. 20, 1975, 2512271

Int. Cl.² H04L 5/00

U.S. Cl. 178—50 **3 Claims**



1. In a system for the time division multiplex (t.d.m.) transmission of binary signals emitted from a plurality of data sources, each of which is connected to a respective input of a multiplexer which during a cycle of operation establishes a conductive connection between each said input and an output for transmission to a receiver over a transmission link, the improvement comprising:

address generator means for, during each said cycle, successively emitting as many address signals as there are data sources, each said address signal being coupled to said multiplexer for establishing the said conductive connections, respectively, between said inputs and said output, and

in-phasing means connecting said output of said multiplexer to said transmission link, said in-phasing means comprising:

a number of one word binary stores corresponding to the number of said data sources,

first, second and third intermediate stores, a start element of a binary word being stored in said first intermediate store responsive to a release signal, said second and third intermediate stores being set to their zero states,

first, second and third switches for, respectively, coupling the contents of said first, second and third intermediate stores into the one of said word stores corresponding to the currently emitted address signal,

fourth, fifth and sixth switches, each having contacts connected to each of said word stores, a center contact of said fourth switch being connected to the output of said in-phasing means,

first adder means connecting a center contact of said fifth switch to an input of said second intermediate store and

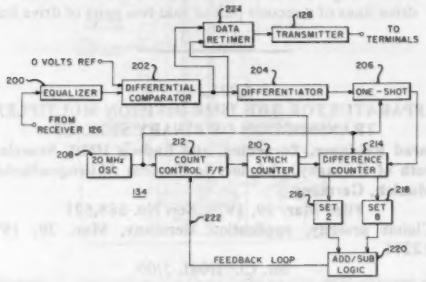
second adder means connecting a center contact of said sixth switch to an input of said third intermediate store.

4,031,317

DATA COMMUNICATIONS SYSTEM WITH IMPROVED DIGITAL PHASE-LOCKED LOOP RETIMING CIRCUIT

Herbert D. McClain, Quaker City; Bipin D. Parikh, and John K. Burkey, both of Cambridge, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 12, 1976, Ser. No. 657,425
Int. Cl.² H04L 7/02
U.S. Cl. 178—69.1 48 Claims



1. A digital phase lock loop circuit for synchronizing bit-shifted data with a retiming clock signal comprising:

means for detecting data transitions in said bit-shifted data and for generating an output data clocking signal in response thereto;

means for deriving a synchronous retiming clock signal;

for comparing said output data clocking signal with said synchronous retiming clock signal for deriving a digital count signal indicative of the phase shift of said output signal with respect to said synchronous clock signal; and

means responsive to said digital count signal for continuously digitally adjusting the phase of said retiming clock signal incrementally such that said output data clocking signal and said retiming clock signal are brought into synchronization.

4,031,318

HIGH FIDELITY LOUDSPEAKER SYSTEM

Lester M. Pitre, Orleans Parish, La., assignor to Innovative Electronics, Inc., Jefferson, La.

Filed Nov. 21, 1975, Ser. No. 634,239
Int. Cl.² H04R 1/02, 1/20, 3/12
U.S. Cl. 179—1 D 11 Claims

1. A high fidelity loudspeaker system comprising:

an enclosed airtight speaker cabinet having three operative panels each having openings therein into the interior of said enclosure and speakers located within said openings closing them off with the backs of said speakers being exposed to said interior through said openings, at least some of said speakers having tubes surrounding them on their back, interior sides extending into said interior, the lengths of at least some of said tubes being substantially different, said tubes serving as anti-resonance decoupling means for said speakers.

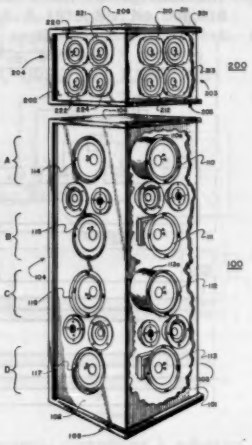
7. A high fidelity loudspeaker system comprising:

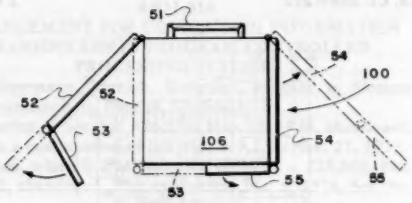
a vertically extended speaker column having three, vertical, operative speaker panels with speakers therein and a fourth back panel; and

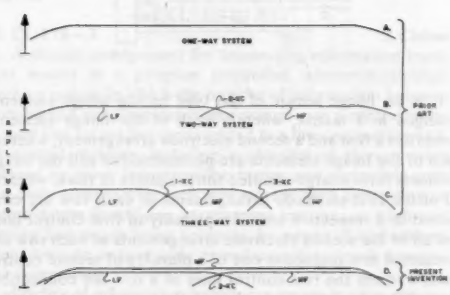
an outer, built-in protective casing for said three panels comprising two hinged wall sections each hinged to opposite side edges of said back panel which when closed cover all three panels and when open form two diagonally disposed sound reflecting surfaces, providing the reflective acoustic effect of said speaker column being located in a corner.

8. A high fidelity loudspeaker system comprising:

a first air-tight, closed cabinet having an array of woofer and tweeter speakers contained therein for reproducing low and high frequencies, respectively; and







a second, air-tight, closed but complementary cabinet physically separate from said first cabinet having an array of mid-range speakers contained therein for reproducing at

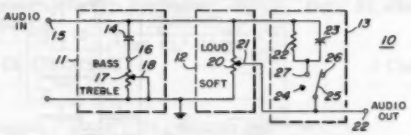
least the mid-range frequencies, said two cabinets placeable together in juxtaposition one on top of the other, outside the enclosure of the other; the speakers in both said cabinets being driven to reproduce complementary sounds.

11. A high fidelity loudspeaker system comprising: an array of woofer, mid-range and tweeter speakers, having low, medium, and high frequency response respectively, wherein said woofers and tweeters include a single frequency cross-over electronic circuit means between them for feeding the low frequency signals only to said woofers and the high frequency signals only to said tweeters, respectively, for the driving thereof, and wherein said mid-range speakers include no frequency cross-over means between them and said woofers and wherein tweeters, said mid-range speakers being driven over at least substantially all of the full spectrum of audio frequencies, said woofers, tweeters and mid-range speakers being generally simultaneously driven to reproduce complementary sounds.

4,031,319
SINGLE CONTROL POWER-FREQUENCY CONTROL CIRCUIT

Samir Thakorbhai Desai, Roselle, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 12, 1975, Ser. No. 640,368
Int. Cl.² H04R *3/00*
U.S. Cl. 179—1 D **14 Claims**



1. An improved single control power-frequency control circuit especially adaptable for use in controlling an audio electrical signal in an automotive entertainment device, comprising:

a first terminal for receiving an audio input signal throughout an audio frequency range,

a second terminal, and

an adjustable control means coupled between said first and second terminals for receiving said audio signal and providing a modified audio signal at said second terminal, said control means providing a single adjustment for selectively emphasizing certain frequencies within said audio frequency range in the modified audio signal while simultaneously substantially increasing the magnitude of the modified audio signal throughout the audio frequency range.

4,031,320
SOUND PRODUCING DEVICE

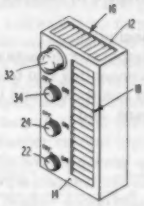
Bridget A. Brand, and Joseph Brand, both of 133 Drexel Road, Ardmore, Pa. 19003

Filed Mar. 19, 1976, Ser. No. 668,411
Int. Cl.² A61M *21/00*
U.S. Cl. 179—1 AA **7 Claims**

1. An apparatus for inducing general relaxation and sleep comprising:

a. a housing having sound ventilating channels disposed therethrough; and

b. a sound producing means disposed within said housing for producing low frequency, periodic oscillatory sound of barely audible amplitude, said sound producing means producing a pre-selected sound having any of a variety of amplitudes between 20 and 50 and decibels, said pre-selected amplitude being controlled to within ±5 decibel percent, during said oscillatory sound period whereby a

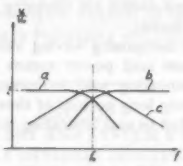


soft background level is attained which masks infrequent yet annoying bursts of consciously perceived noise.

4,031,321
LOUDSPEAKER SYSTEMS

Knud Erik Bakgaard, Struer, Denmark, assignor to Bang & Olufsen A/S, Denmark

Continuation of Ser. No. 521,094, Nov. 5, 1974, abandoned.
This application Feb. 17, 1976, Ser. No. 658,526
Claims priority, application United Kingdom, Nov. 6, 1973, 51482/73
Int. Cl.² H04R *1/24, 3/04, 3/14*
U.S. Cl. 179—1 D **13 Claims**



1. A loudspeaker system comprising a first and a second main driver connected to common signal input terminals through crossover network means designed so as to pass signals of frequencies lower than a predetermined crossover frequency to said first driver and signals of frequencies higher than said crossover frequency to the second driver, while in a crossover frequency range the signals are passed to both drivers with an amplitude which for increasing frequencies is decreasing for said first driver and increasing for said second driver in such a manner that the transfer function of the loudspeaker system is approximated to a constant function inside and is substantially constant outside said crossover frequency range, characterized in that in addition to said two drivers there is provided at least one auxiliary compensation driver adapted to work in said crossover frequency range and being operable to reproduce an acoustic signal with a frequency-amplitude characteristic which, combined with the corresponding characteristics of the two main drivers, results in the total transfer function of the loudspeaker system being substantially constant inside and outside the crossover frequency range.

4,031,322
TELEPHONE OPERATED SIGNALLING SYSTEM

Steven T. Churchill, Wilton, Conn., assignor to Letot, Incorporated, Fairfield, Conn.

Filed Sept. 30, 1975, Ser. No. 618,148
Int. Cl.² H04M *11/02*
U.S. Cl. 179—2 A **3 Claims**

1. A telephone operated signalling system having:

A. A telephone substation,

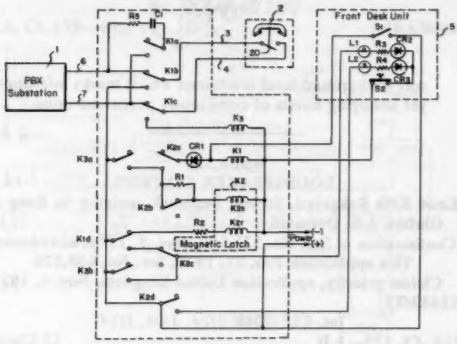
B. A telephone having a manually operated switch connected to said substation by telephone wires,

C. A desk unit having an actuation switch and indicating means for indicating status of a room,

D. Power means adapted to energize said indicating means, and

E. Circuit means including:

i. First means responsive to actuation of said actuation switch for disconnecting said telephone wires from said substation and connecting said telephone wires to said indicating means, and



ii. Second means responsive to movement of said manually operated switch for changing energization of said indicating means;

the improvement comprising having indicator switch means positioned between said power means and said indicating means for disconnecting said indicating means from said power means during long periods of time that said telephone wires are connected to said indicating means.

4,031,323

REMOTE CONTROLLABLE TELEPHONE ANSWERING DEVICE HAVING A DUAL PLAYBACK CAPABILITY

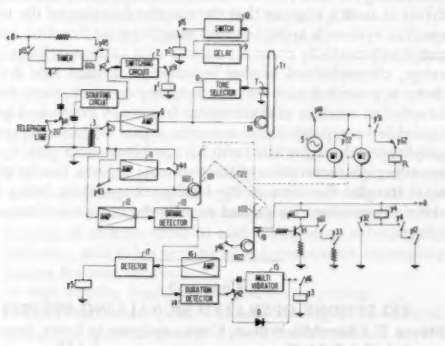
Shizuo Ando, and Akira Okamura, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 28, 1975, Ser. No. 563,031

Claims priority, application Japan, Mar. 29, 1974, 49-36215

Int. Cl.² H04M *1/64*

U.S. Cl. 179—6 E **5 Claims**



1. A remote controllable automatic telephone answering device adapted to be connected to a telephone line, said device comprising; an answer tape, means for reproducing an answer prerecorded on said answer tape and sending out said reproduced answer in response to the reception of a calling signal via said telephone line, a message tape, means for recording callers' messages on said message tape when it is unwinding, means for detecting a remote control signal received via said telephone line, first means for rewinding the message recording tape for a fixed time period in response to a first detection of a first said remote control signal and for reproducing any messages on the thus rewound part of said message tape, said fixed time period being independent of the duration of said remote control signal and independent of the amount of tape unwound, second means responsive to a subsequent detection of a second said remote control signal during the reproducing of said messages for rewinding said message tape for a period corresponding to the duration of the second remote control signal and for reproducing any messages on the part of said message tape thus rewound, and means for sending out said reproduced messages via said telephone line.

4,031,324

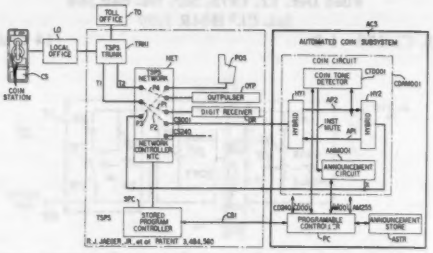
AUTOMATED COIN ARRANGEMENT PROVIDING INTERFERENCE FREE COIN DEPOSIT DETECTION DURING ANNOUNCEMENTS

Ronald Michael Dudonis, Englishtown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 24, 1976, Ser. No. 689,600

Int. Cl.² H04M *17/00*

U.S. Cl. 179—6.3 R **19 Claims**



1. In combination,

generating means for generating voice announcements,

detecting means for detecting distinct signals originating at a telephone station, and

coupling means for coupling said generating means to a transmission path connectible to said telephone station to transmit said voice announcements thereover and for coupling said detecting means to said transmission path to detect said distinct signals received thereover from said telephone station,

said coupling means including isolating means for isolating said detecting means from said generating means.

4,031,325

CALLED PARTY FRAUD PREVENTION IN AN AUTOMATED COIN SYSTEM

Ronald Michael Dudonis, Englishtown; Charles Glenn Morrison, Holmdel, both of N.J.; Robert Lawrence Potter, Naperville, Ill., and Kenneth Streisand, East Brunswick, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 21, 1976, Ser. No. 698,186

Int. Cl.² H04M *15/18*

U.S. Cl. 179—6.3 R **16 Claims**

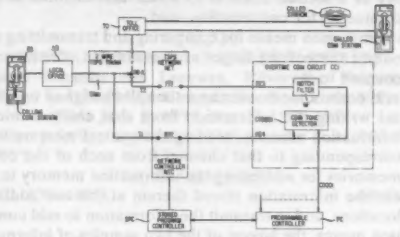
1. Apparatus for preventing called party fraud in a coin station originated call wherein a connection is established between the calling coin station and a called station, which comprises

means for splitting the connection into a calling station portion and a called station portion,

a filter attenuating a frequency component in signals indicative of coin deposits,

a coin tone detector detecting signals indicative of coin deposits, and

extending means for extending said calling station portion to said coin tone detector and for extending said called station portion to said filter,



said extended called station portion being connected via said filter to said extended calling station portion to reconnect said calling and called stations.

4,031,326

TELEPHONE ARTERY WITH MULTIPLE ACCESS POINTS AND TELEPHONE NETWORKS WITH SUCH ARTERIES

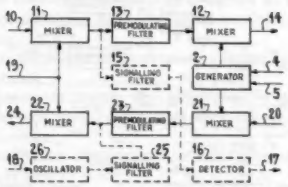
Pierre Deman, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 30, 1975, Ser. No. 627,456

Claims priority, application France, Oct. 31, 1974, 74.36491

Int. Cl.² H04J 1/00

U.S. Cl. 179—15 FS **6 Claims**



1. A two-way telephone artery, having first and second terminals, for transmitting in each direction channels forming part of a predetermined multiplexed set of g channels in a telephone system using premodulation and single sideband frequency multiplexing, said set of channels being such that any of its channels may be selectively translated into the pass-band of a premodulation filter by means of a mixer receiving said set and a carrier current associated with this channel, said artery having first and second transmission channels for transmitting telephone communication in first and second directions, and M access points, M at least equal to 3, at m of which, $1 \leq m \leq M$, m multiplexing and demultiplexing switching devices are respectively coupled to said artery for selectively inserting telephone channels in the group of channels transmitted by said first transmission channel at vacant positions of said set and selectively extracting telephone channels from the group of channels transmitted by said second transmission channel, the inserted and extracted telephone channels occupying the same frequency bands in said transmission channels, the i^{th} switching device ($i = 1, 2 \ldots m$) starting from said first terminal comprising p_i, $1 \leq p_i \leq g$ telephone channel circuits, each of said telephone channel circuits comprising first and second branches, said first branch comprising, in series, an input mixer having a first input, forming a first input of this channel circuit, for receiving a low frequency channel, and a carrier current input for receiving a current at the premodulation frequency, a premodulation filter having an output, and an output mixer having a first input coupled to said output of said premodulation filter, a carrier current input, and an output forming a first output of this channel circuit, said second branch comprising in series an input mixer having a first input forming a second input of this channel circuit and a carrier current input, a premodulation filter having an output, and an output mixer having a first input coupled to said output of said premodulation filter of said second branch, a carrier current input for receiving said current at the premodulation frequency and an output forming a second output of this channel circuit, each of said telephone channel circuits further comprising a digitally controllable variable frequency generator having an output connected to the carrier current inputs of said output mixer of said first branch and of said input mixer of said second branch, said i^{th} switching device further comprising, for $i < m$, a regrouping coupling device having inputs and an output, inserted by an input and its output in said first transmission channel, and having p_i other inputs connected respectively to the first outputs of said p_i telephone channel circuits, and a distribution coupling device having an input and outputs, inserted by its input and an output in said second transmission channel, and having p_i other outputs connected respectively to the second inputs of said p_i telephone channel circuits, said artery further comprising at said first terminal a terminal arrangement having an input coupled to said first transmission channel and an output coupled to said second transmission channel; the first inputs and second outputs of the p_m channels of the m^{th} switching device being respectively coupled to said first and second transmission channel of said artery at said second terminal through regrouping and distribution coupling devices respectively.

4,031,327

TELEPHONE SET AND SYSTEM UTILIZING FREQUENCY DIVISION MULTIPLEXING

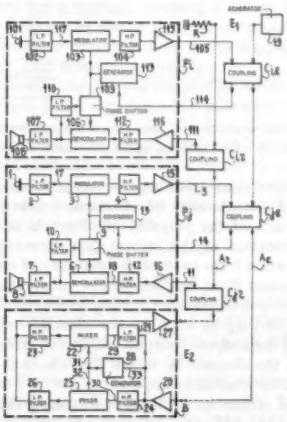
Henri Butin, and Pierre Deman, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 6, 1976, Ser. No. 674,676

Claims priority, application France, Apr. 11, 1975, 75.11311

Int. Cl.² H04J 1/06

U.S. Cl. 179—15 FD **3 Claims**



1. A telephone set having first and second inputs and an output, and comprising a transmitter channel for delivering to said output a variable carrier frequency output signal with double side-band amplitude modulation and carrier component and a receiver channel having an input coupled to said telephone set first input for receiving a multiplex high fre-

quency signal including, when said set is being used for communication, a multiplexed signal having the same carrier frequency as said output signal with double side-band amplitude modulation and carrier component;

said transmitter channel comprising: a programmable generator having an output, for supplying said output signal variable carrier frequency, and a sync input; and an amplitude modulator having a first input for receiving voice signals from a microphone, a second input and an output; said sync input being coupled to said second input of said telephone set for receiving a reference frequency, said second input of said modulator being coupled to said generator output, and said modulator output being coupled to said telephone set output;

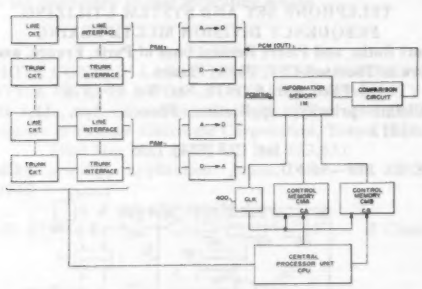
said receiver channel comprising: an electroacoustic transducer, a synchronous demodulator having a first input coupled to said receiver channel input for receiving said multiplex high frequency signal, a second input and an output for delivering to said transducer the modulating signal from said multiplexed signal and a control voltage; and a variable phase-shifter having a signal input coupled to said generator output, a control input coupled for receiving said control voltage and an output coupled to said demodulator second input.

4,031,328

CONFERENCING ARRANGEMENT FOR USE IN A PCM SYSTEM

Satyan G. Pitroda, Villa Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 18, 1975, Ser. No. 614,406
Int. Cl.² H04M 3/56; H04Q 11/04
U.S. Cl. 179—18 BC 4 Claims



1. In a pulse code modulated communication system having

a. a plurality of channels, each of which is assigned a time slot,

b. an information memory for storing information from each of the plurality of channels, transmit information from each of the plurality of channels stored in a first fixed location of the information memory and receive information from each of the plurality of channels stored in a second fixed location of the information memory,

c. a first control memory having a control memory word corresponding to each of the plurality of channels for storing the address location within the information memory of the channel to which that channel is to be connected for conversation, and

d. control means for cyclically controlling the operation of the system, said control means during a time slot assigned to a channel writing the information from that channel into the information memory, reading the control memory word corresponding to that channel from the control memory to address the information memory to read out the information stored therein at the addressed location, and to transmit the information read therefrom to that channel, to thereby permit that channel to engage in conversation with another channel, the improvement comprising:

e. a second control memory having a control memory word corresponding to each of the plurality of channels for storing the address location within the information memory of a second channel to which that channel is to be connected for conversation, and

f. a comparison means for comparing and transmitting as an output thereof the larger of two samples of information coupled to it,

g. said control means during a time slot assigned to a channel writing the information from that channel into the information memory, reading the control memory words corresponding to that channel from each of the control memories for addressing the information memory to read out the information stored therein at the two addressed locations, and to transmit the information to said comparison means, the largest of the two samples of information coupled to said comparison means being coupled to that channel,

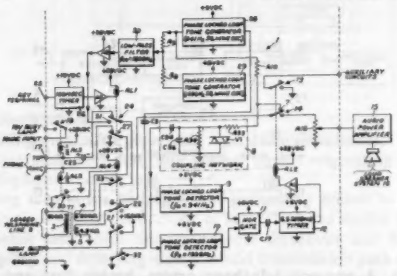
h. whereby 3-way conferencing between the plurality of channels can be provided.

4,031,329

TIME LIMITED TELEPHONE PAGING EMPLOYS A RELAY SWITCH ACTUATED BY DUAL FREQUENCY TONE

B. Ronald Saxon, Harrisburg, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 479,005, June 13, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 673,233
Int. Cl.² H04M 11/02
U.S. Cl. 179—18 BF 23 Claims



1. An arrangement to control a loud speaker system at a remote location from a local location comprising:

a telephone line having a given operating frequency band interconnecting said local location to said remote location;

said loud speaker system being normally disconnected from said telephone line;

a first source of a first audio control signal disposed at said local location, said first audio control signal having a first given frequency;

a second source of a second audio control signal disposed at said local location, said second audio control signal having a second given frequency different than said first given frequency;

first means coupled between said first and second sources and said telephone line at said local location to inject a short burst of said first and second audio control signals simultaneously into said operating frequency band of said telephone line;

second means coupled to said telephone line at said remote location to detect both said first and second audio control signals and provide only a logic "1" output signal only when both of said first and second audio control signals are detected simultaneously; and

third means coupled to said second means responsive to

said output signal to actuate a relay and a contact thereof which connects said loud speaker system to said telephone line for a given period of time after cessation of said first and second audio control signals to enable said loud speaker system to broadcast a page message transmitted on said telephone line from said local location.

4,031,330
DIGITAL RADIO TRANSMISSION SYSTEM

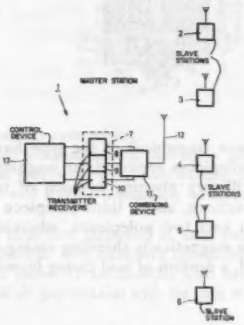
Johannes Cornelis van Leeuwen, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 5, 1975, Ser. No. 584,187

Claims priority, application Netherlands, June 10, 1974, 7407717

Int. Cl.² H04J 3/12

U.S. Cl. 179—41 A **10 Claims**



1. A digital transmission system comprising

a master station having a transmit-receive device for transmission of time-compressed digital signals by means of a plurality of simultaneously generated carrier frequencies, comprising

first generator means for generating a frame synchronization pattern;

second generator means for generating a plurality of different signalling code words each representive of a given function;

switching means for connecting the said generators to the transmitter; and

control means having an output for operating said switching means for periodically transmitting said frame synchronization pattern simultaneously on each of said generated carrier frequencies, and for periodically transmitting a plurality of signalling code words selected as required for each carrier frequency in fixed time intervals situated within the frame duration determined by successive frame synchronizing patterns; a plurality of slave stations each comprising a transmit-receive apparatus for transmission and reception of time-compressed digital signals under the control of said master station, and

channel selection means for tuning the receiver in a first operating condition successively for given short periods to each of the carrier frequencies of the system.

4,031,331
TELEPHONE SPEECH NETWORK

Mevhibe Gulay Sencer, Ottawa, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Jan. 15, 1976, Ser. No. 649,557

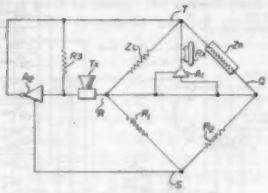
Int. Cl.² H04M 1/58

U.S. Cl. 179—81 A **4 Claims**

1. A telephone speech network, for connecting a transmitter and a receiver to a line powered telephone line, comprising:

a first amplifier, the output of which is connected in series with a line terminating resistance across the telephone line, the input to said amplifier being responsive to both the received signals on the telephone line and to the signals at the output of the transmitter;

a bridging resistance and a bridging impedance connected in series across said amplifier, for summing substantially equal magnitude receive signal currents and for subtracting substantially equal magnitude transmit signal currents, coupled from the output of the amplifier and from across the telephone line to the junction of said bridging resistance and impedance; and



a second amplifier means for connecting the resultant signals at said junction to said receiver.

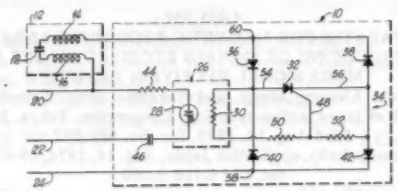
4,031,332
TELEPHONE RINGER INSOLATOR

Paul Shylo, Arlington Heights, Ill., assignor to Cook Electric Company, Morton Grove, Ill.

Filed Feb. 2, 1976, Ser. No. 654,404

Int. Cl.² H04M 1/00

U.S. Cl. 179—84 R **17 Claims**



1. An isolator for selectively coupling a means to be energized which is coupled to one of a pair of telephone lines to a reference potential in response to an activating signal on the telephone lines, said isolator comprising:

a controlled conduction means coupled between said means to be energized and said reference potential, and

an isolator means coupled to said telephone lines and to said controlled conduction means, said isolator means controlling said controlled conduction means to connect said means to be energized to said reference potential in response to said isolator means receiving said activating signal on said telephone lines.

4,031,333
CIRCUIT TO INDICATE THE SIMULTANEOUS OFF-HOOK CONDITION OF AT LEAST TWO OF A PLURALITY OF TELEPHONE SUBSETS ON THE SAME TELEPHONE LINE

George Thomas Fouratt, Santa Maria, Calif., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 14, 1976, Ser. No. 705,218

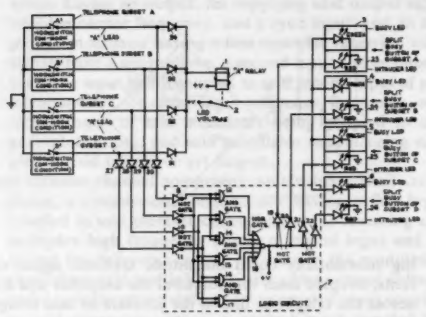
Int. Cl.² H04M 1/00

U.S. Cl. 179—81 R **16 Claims**

1. An indicator circuit for a telephone system to indicate when at least two of a plurality of telephone subsets on the same telephone line are simultaneously in off-hook condition comprising:

at least one indicator contained in one of said plurality of

subsets which when activated indicates that at least said one of said plurality of subsets and another of said plurality of subsets are in said off-hook condition simultaneously; and



a logic circuit coupled between all of said plurality of subsets and said indicator to produce an output signal to activate said indicator when at least said one of said plurality of subsets and said another of said plurality of subsets are detected to be in said offhook condition simultaneously.

4,031,334

APPARATUS FOR MAGNETIC RECORDING AND/OR REPRODUCING OF SIGNALS RECEIVED BY ONE OR MORE SIGNAL RECEIVING DEVICES

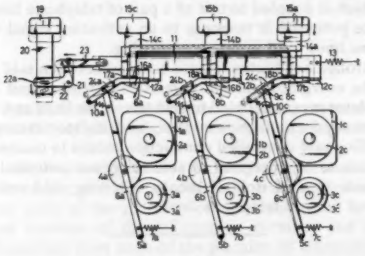
Hiroyuki Kimura, Atsugi, and Takahiko Saito, Kamakura, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 11, 1975, Ser. No. 603,537

Claims priority, application Japan, Aug. 14, 1974, 49-97102

Int. Cl.² G11B *31/00*

U.S. Cl. 179—100.11 **14 Claims**



1. An apparatus comprising a recording device, at least one original receiving device including tunable signal selecting means operable to tune said receiving device to any one of plural signal channels so as to select the signal received by said signal receiving device, control means selectively operable for applying the signal received by said signal receiving device to said recording device for recording by the latter, and means responsive to the operation of said control means for maintaining the tuning condition of said signal selecting means at the one signal channel to receive said signal and for preventing said signal selecting means from being tuned to a different signal channel so as to avoid changing of the signal selected for reception by said signal receiving device during recording of said signal.

4,031,335

STEREO PICK-UP WITH CASING SERVING AS COMMON POLE PIECE

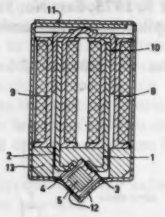
Elzo Smit, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,736

Claims priority, application Netherlands, Apr. 1, 1974, 7404359

Int. Cl.² H04R *11/12*

U.S. Cl. 179—100.41 K **11 Claims**



1. A track groove transducer of the type having a stylus holder and two polepieces arranged for magnetic sensing of stylus holder oscillatory pivoting in each of two mutually perpendicular directions, and a third polepiece cooperating magnetically with said two polepieces, wherein said transducer comprises a magnetically shielding casing made of soft magnetic material, a portion of said casing forming said third polepiece.

4,031,336

ELECTROMAGNETIC PICKUP WITH MAGNETIC GAP DISPLACEMENT GENERATOR

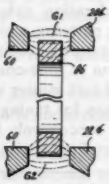
Joseph F. Grado, 4614 Seventh Ave., Brooklyn, N.Y. 11220

Filed Feb. 10, 1975, Ser. No. 548,698

The portion of the term of this patent subsequent to Apr. 29, 1992, has been disclaimed.

Int. Cl.² H04R *11/12*

U.S. Cl. 179—100.41 K **11 Claims**



1. A replaceable module for an electro-magnetic cartridge comprising a carrier, first and second magnetic members mounted in opposing relationship on said carrier and cooperatively positioned to define first and second operating gaps, a stylus lever operatively mounted on said carrier and extending generally parallel to the length dimension of said operating gaps, a generator operatively mounted on said stylus lever and extending at least partially into said operating gaps between said first and second magnetic members, said generator mounted for movement substantially perpendicular to said operating gaps in response to movement of said stylus lever.

4,031,337
LOUDSPEAKER

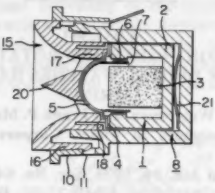
Yasushi Okamura; Kiichiro Tanaka, and Takashi Takeda, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 3, 1975, Ser. No. 637,282

Claims priority, application Japan, Dec. 16, 1974, 49-152999; Dec. 16, 1974, 49-153001

Int. Cl.² H04R *9/00*; **G10K** *13/00*

U.S. Cl. 179—115.5 H **5 Claims**



1. A loudspeaker comprising:

a cup-shaped enclosure unit having a closed end and a cylindrical side wall, a portion of said side wall remote from said end having a plurality of circumferential slots therein;

a magnetic structure disposed in said enclosure unit and secured thereto, said structure comprising magnetic material and have (i) an annular end surface and (ii) a cylindrical air gap coaxial with the side wall of said enclosure unit;

a flexible diaphragm having a circular outer ring adjacent the annular end surface of said magnetic structure;

a voice coil secured to said diaphragm and disposed within said air gap;

a horn unit having an outer cylindrical portion, a cylindrical alignment portion, and an inner cylindrical diaphragm retaining portion;

said outer portion of said horn unit having a corresponding plurality of flexible pawl parts in interlocking engagement with the slots of said enclosure unit;

the alignment portion of said horn unit having an outer diameter slightly less than the inner diameter of the wall portion of said enclosure unit, said alignment portion being disposed adjacent said wall portion;

the inner portion of said horn unit having an annular end part adjacent the circular outer ring of said diaphragm, so that said diaphragm is retained in position with the circular outer ring thereof disposed between the annular end surface of said magnetic structure and the annular end part of said inner portion of said horn unit.

4,031,338
ECHO SUPPRESSOR USING FREQUENCY-SELECTIVE CENTER CLIPPING

Samuel Joseph Campanella, Gaithersburg, Md.; Hans Dodel, Alexandria, Va., and Henri George Suyderhoud, Potomac, Md., assignors to Communications Satellite Corporation (COMSAT), Washington, D.C.

Filed Feb. 10, 1976, Ser. No. 656,903

Int. Cl.² H04B *3/20*

U.S. Cl. 179—170.8 **8 Claims**

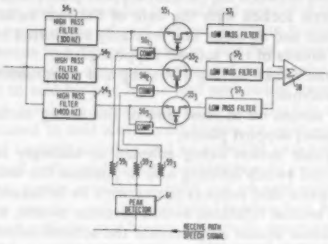
1. An echo suppressor for use in long distance telephone speech communication systems having a send path and a receive path, comprising:

a first plurality of filter networks connected in said send path for dividing a band width of the send path into a like plurality of contiguous frequency bands;

a plurality of center-clipping networks connected to the outputs of said first plurality of filter networks on a one-to-one basis, said center-clipper networks being operative to reduce to zero a signal applied thereto whenever the signal's instantaneous absolute level is at or below a threshold level;

summing means connected to receive the outputs of all of said center-clipper networks and providing a combined output signal; and

threshold control means connected to receive a signal in said receive path to detect the overall peak signal level of said signal, said threshold control means producing



plurality of threshold control signals in response to the detected overall peak signal level of a signal in said receive path which control signals are applied to respective ones of said center-clipper networks, the ratios of said threshold control signals produced by said control means being determined by the ratios of the predetermined average energy of the telephone speech in said plurality of frequency bands.

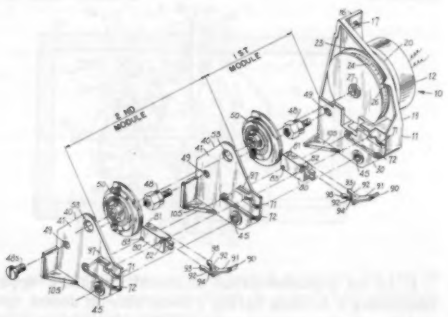
4,031,339
MODULAR TIME SEQUENCE CONTROLLER

Claude V. Koch, Two Rivers, Wis., assignor to AMF Incorporated, White Plains, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,990

Int. Cl.² H01H *43/10*, *9/02*

U.S. Cl. 200—38 BA **8 Claims**



1. In a modular time sequence controller the combination comprising

a first rotatable switch actuator means including an axle having an axle interlock means on at least one end thereof,

means for rotating said axle,

a first switch having an actuator,

means for mounting said switch proximate said first rotatable switch actuator in position to be actuated during rotation of the switch actuator means,

a pair of support plates,

bearing means in each support plate for rotatably supporting an axle,

spacer and fastening means for maintaining said support

plates in spaced parallel relationship with said bearing means in axial alignment,

said first rotatable switch actuator means having its end with the interlock means thereon rotatably supported by the bearing means of the first one of said support plates,

a second rotatable switch actuator means including a second axle which has axle interlock means on each end thereof,

said second rotatable switch actuator means being positioned between the parallel support plates with one end of its axle locked with the axle of the first switch actuator means and its other end rotatably supported by the bearing means of the second support plate,

a second switch having a housing and an actuator extending therefrom,

guide means on at least one of the facing surfaces of the parallel support plates,

said guide means being adapted to slidingly receive said second switch housing and to position the second switch between said support plates with its actuator proximate the second rotatable switch actuator means, whereby the actuator means may actuate the second switch,

detent means on at least one of the facing surfaces of the parallel support plates,

detent engaging means on said second switch housing engageable with said detent means, and

keeper means insertable transversely between said support plates and engageable with said second switch housing for urging said detent engaging means into a retaining engagement with the detent means while the keeper means is in place.

4,031,340

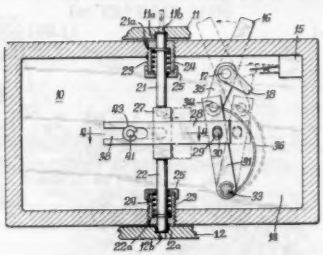
DEFEATER FOR MECHANICAL SAFETY INTERLOCK FOR COVERS OF EXPLOSION-PROOF ELECTRICAL HOUSING

Robert J. Pastorel, Chicago, Ill., assignor to Appleton Electric Company, Chicago, Ill.

Filed Nov. 7, 1975, Ser. No. 629,900

Int. Cl.² H01H *9/20, 33/46*

U.S. Cl. 200—50 A **4 Claims**



1. In an explosion-proof electrical enclosure apparatus comprising a housing having a body with an access opening and threads therearound and a cap threaded onto said threads and covering said opening, an electrical switch within said housing and operable between a switch-open position and a switch-closed position, said switch having a member within said housing for moving the switch between said positions which member is operable from outside said housing, a locking device interengaging said cap and said body and movable between a first position at which said cap is locked at a desired location against rotation and a second position at which said cap is free to be rotated to unthread the cap for removal to expose said opening, and interlocking means operatively interconnecting the switch operating member and said cap locking device and including a locking part movable along a path between two positions respectively corresponding to said two positions of said member for retaining said locking device in said first position thereof so long as the member is in the switch-closed position while freeing the locking device for movement to the second position so long as the member is in the switch-open position, the improvement comprising:

defeater means operatively engaging said interlocking means for moving said locking part along a second path between its position at the switch-closed position and a third position thereof at which it frees the locking device for movement to the second position, said defeater means includes an operating component unmanifestly located at the exterior of said body for moving said locking part along said second path.

4,031,341

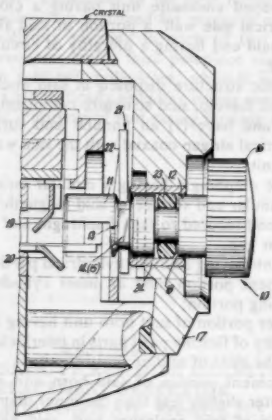
DUAL FUNCTION PUSHER AND ROTATE SWITCH FOR SOLID STATE DIGITAL WATCHES HAVING DETENT SPRING

Paul Wuthrich, Watertown, and Frank P. Mascia, Bristol, both of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Jan. 14, 1976, Ser. No. 649,115

Int. Cl.² G04C *9/00;* **G04B** *27/00;* **H01H** *13/52*

U.S. Cl. 200—52 R **9 Claims**



1. A dual function rotate and pusher device and switch assembly for an electronic watch having a case with an opening for access to the interior thereof which comprises:

a shaft mountable in said opening for axial and rotational movement and having an eccentric tab at the interior end thereof, and a detent retainer section, and an actuating end portion;

a plurality of switch blade means mounted for selective engagement with the eccentric tab; and

biasing means engaging the detent retainer section and the shaft for providing longitudinal and detented rotational movement of the shaft to enable engagement with a selected switch blade by the eccentric tab with longitudinal and/or rotational movement of the shaft.

4,031,342

MATERIAL SENSING SWITCH

Reuben E. Peterson, 402 E. Washington Ave., Fergus Falls, Minn. 56537

Filed Feb. 11, 1976, Ser. No. 657,285

Int. Cl.² H01H *35/00*

U.S. Cl. 200—61.21 **3 Claims**

1. A material sensing switch assembly comprising, a hollow body means having open opposite ends,

connection means for securing said body means to a support means,

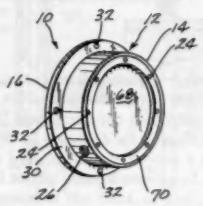
a substantially flat, circular backing plate means removably closing one of said opposite ends,

a substantially flat, circular switch support plate means removably mounted in said body means adjacent the other of said opposite ends, said switch support plate having inner end outer sides,

said switch support plate means having a centrally disposed opening formed therein,

a switch means mounted at the inner side of said switch support plate means,

switch actuator means comprising an elongated switch arm secured at one end to said inner side of said switch support plate means outwardly of the center thereof and extending towards said centrally disposed opening in a spaced relationship to said inner side, said switch arm having an end portion which extends through said centrally disposed opening and which has an actuator portion



positioned outwardly of said outer face of said switch support plate means,

a pressure plate means removably mounted adjacent the outer side of said switch support plate means for engagement with said actuator portion of said switch arm when said pressure plate means is moved towards said switch support plate means,

said switch arm being positioned outwardly of said switch means and being adapted to actuate said switch means when said pressure plate means moves said actuator portion of said switch arm inwardly with respect to said switch support plate means,

a flexible member operatively removably secured to said body means and covering said pressure plate means for sealing said other end of said body means,

and means securing said flexible member to said body means.

4,031,343

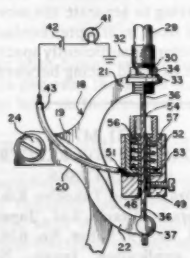
BICYCLE BRAKE LIGHT SWITCH AND STOP LIGHT SYSTEM BEING ACTIVATED BY HAND BRAKE LEVER AND CABLE

Roy Sopko, 21 Huckleberry Lane, Holbrook, N.Y. 11741

Filed Sept. 2, 1975, Ser. No. 609,301

Int. Cl.² B60Q 1/44; B62J 5/00; H01H 3/16, 17/08

U.S. Cl. 200—61.12 **5 Claims**



4. In combination with a bicycle having a hand operated caliper brake including a pair of relatively rockable caliper levers having first and second proximal ends remote from the lever braking ends and swingable between contracted braking and spread release positions and a sheathed control cable member having a sheath anchored to said first proximal end and a flexible cable extending through said sheath and anchored to said second proximal end, a stop light mechanism comprising an electric bulb, a source of current and normally open switching means connected in series with said bulb across said current source, and including a switch component mounted on said flexible cable between said first and second proximal ends and engageable by said first proximal end incident to the contraction of said caliper levers to transfer said switching means to a closed condition, siad first proximal end being provided with a contact member defining portion which is grounded to said bicycle frame and said swithc component comprises an insulator sleeve secured to said flexible cable, a cylinder secured to said sleeve and having an open end confronting said contact member and an opposite end wall and a peripheral wall with a radial bore proximate said cylinder end wall, a metal piston movable in and out of said cylinder, a metal sleeve coaxial with and slidably sandwiched between said piston and cylinder and having a centrally apertured inner end wall and a compressor spring entrapped between said inner end wall and said piston to bias said piston and metal sleeve outwardly and inwardly respectively, and a cable conductor passing through said radial bore and clamped between the confronting walls of said cylinder and metal sleeve, said cable conductor being connected in series with said current source and bulb to said bicycle frame.

4,031,344

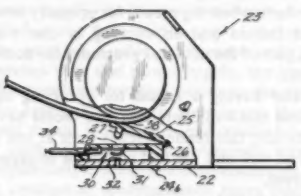
INTEGRAL HINGE SENSING SWITCH

Regis Victor Pilarski, Utica, and Robert John Rumpf, Grosse Pointe, both of Mich., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 15, 1976, Ser. No. 667,263

Int. Cl.² H01H 3/16

U.S. Cl. 200—61.58 B **6 Claims**



1. In an integral hinge sensing switch assembly for use in sensing a seat belt spool condition in a seat belt retractor assembly and the like comprising:

a switch housing having an integrally biased push arm follower plate integrally hinged thereto, said push arm follower plate positioned in biased pivotal follower contact with the outer surface of a seat belt rolled on the spool of a seat belt retractor assembly in register therewith, said push arm follower plate provided with an actuator pin adapted for movement into said housing when said push arm follower plate is pivotally moved in response to a selected spool condition, said switch housing provided with an actuator pin access opening in the upper surface thereof in register with said actuator pin; and

switch means provided in said housing in actuating register with said actuator pin opening, said switch means selectively actuated by selective movement of said actuator pin there against.

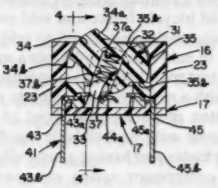
4,031,345
MINIATURE ELECTRICAL SWITCH

Ricardo L. Garcia, Justice, Ill., assignor to Grayhill, Inc., LaGrange, Ill.

Continuation-in-part of Ser. No. 533,882, Dec. 18, 1974, Pat. No. 3,958,090. This application Nov. 26, 1975, Ser. No. 635,652

Int. Cl.² H01H *13/28*

U.S. Cl. 200—67 AA 21 Claims



1. A miniature electrical switch for controlling the operation of circuit means comprising,

a housing of electrical insulating material,

said housing including a cover and a base plate,

said cover being generally rectangular in shape and having a top wall, opposed side and end walls and defining an opening opposite the top wall,

and switching means within the housing which includes a contact assembly, a switch actuator, a biasing means and an electrically conductive ball contactor, wherein said switch actuator, biasing means and ball contactor move together between first and second switch positions relative said contact assembly,

said base plate being sized to close the opening opposite the top wall and retain said switching means within the housing,

said cover having bearing means for pivotally mounting said actuator therein and an opening in one wall through which a part of the actuator protrudes for access to operate same,

said actuator having a recess for receiving said biasing means and said ball contactor, said recess having an end wall, whereby said biasing means seats at one end on the recess end wall and the ball contactor engages the other end thereof,

said contact assembly including a terminal support member of electrical insulating material and a set of firsts, second and third electrically conductive members, each conductive member having a contact portion and a conductor connection portion, said contact portions being spaced apart along a line transverse the pivot axis of the actuator and in alignment with the path of movement of the ball contactor for engagement therewith, and said conductor connection portions extending through holes in said base plate to the exterior of the housing,

and said biasing means urging said actuator into seated position in the bearing means and said contactor into engagement with said contact portions, said contact portions being arranged to cause positive positioning of the contactor with said first and second contact portions or said second and third contact portions thereby causing positive positioning of said actuator and electrical connection between said first and second contact portions or said second and third contact portions.

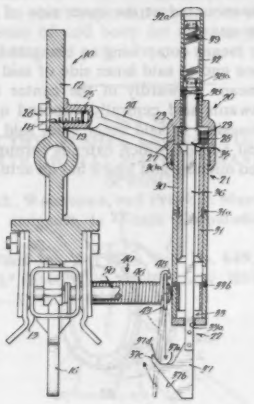
4,031,346
ELECTRICAL INTERRUPTER SWITCH

Ronald P. Bridges, 9 South 681 Brookeridge Road, Downers Grove, Ill. 60515

Filed Oct. 20, 1975, Ser. No. 623,792

Int. Cl.² H01H *33/12*

U.S. Cl. 200—146 R 28 Claims



1. An electrical disconnect switch and circuit interrupter comprising, in combination:

a switch body including a fixed electrical contact structure;

a movable electrical contact structure pivoted on said switch body for movement in a path between a closed position engaging the fixed contact structure, and an open position spaced from said fixed contact structure;

an elongate, tubular circuit interrupter assembly housing which has a lining of arc-extinguishing material;

a fixed electrical interrupter contact in said housing;

a movable electrical interrupter contact in said housing which occupies a normal position abutting said fixed interrupter contact and has an integral electrically conductive actuating rod projecting out an end of the housing;

a bracket supporting said housing on the fixed contact structure and providing an electrically conductive path between the fixed interrupter contact and the fixed contact structure;

a fixed catch on the exterior of the housing which is electrically connected to the actuating rod;

an actuating catch on the outer end of the actuating rod adjacent said fixed catch;

and an electrically conductive interrupter operating arm on the movable contact structure, said operating arm being positioned to move in a path in which it sequentially engages the fixed catch and the actuating catch during movement of the movable contact structure from closed position, and serving to separate the movable interrupter contact from the fixed interrupter contact after the movable contact structure is sufficiently spaced from the fixed contact structure to avoid arcing between said structures.

4,031,347
PROTECTIVE GAS CAP FOR ELECTRIC POWER APPARATUSES

Tosio Isikawa; Jun Ozawa, and Takehiro Kikuchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 29, 1975, Ser. No. 626,992

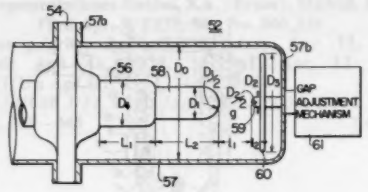
Claims priority, application Japan, Nov. 11, 1974, 49-128999

Int. Cl.² H02H *33/22, 1/00*

U.S. Cl. 200—148 B 9 Claims

1. A protective gas gap for electric power apparatus having

a cylindrical vessel electrically grounded and filled with an electronegative gas and a pair of electrodes oppositely disposed to each other with a predetermined gap therebetween in said cylindrical vessel substantially in alignment with the center-line of said vessel, one of said pair of electrodes being connected with a high tension charged conductor which is in turn connected to a transmission line while the other being electrically grounded; in which each of the confronting portions of said pair of electrodes is formed to have a substantially semispheric smooth surface; in which the maximum diameter of the end portion of said grounded electrode is smaller than that of the end portion of said high tension side electrode; and in which a plate-like back electrode having a diameter which is substantially equal to the inner diameter of said cylindrical vessel is closely disposed at the back of said grounded electrode.



4,031,348

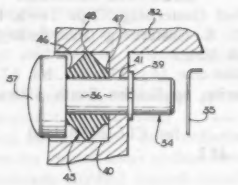
PUSH-BUTTON ASSEMBLY SWITCH FOR WATCHES

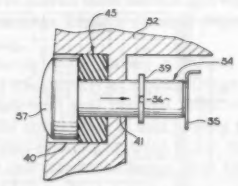
Noel H. Eberhardt, Cupertino, Calif., assignor to Microma Incorporated, Cupertino, Calif.

Continuation-in-part of Ser. No. 633,853, Nov. 20, 1975, abandoned. This application Oct. 7, 1976, Ser. No. 730,527

Int. Cl.² H01H 3/12

U.S. Cl. 200—159 R **4 Claims**





1. A low voltage push-button switch assembly for a watch for engaging a bore disposed through a watch case, said bore including a counter bore on the exterior surface of said watch case, comprising:

an electrical contact member disposed within said watch case;

a push-button member including a button and a shaft, said shaft slidingly engaging said bore for axial movement within said bore such that said shaft may be urged in contact with said electrical contact member;

a compressible, resilient, generally cylindrical integral sealing member engaging said shaft and disposed within said counter bore, the ends of said sealing member defining sleeves for engaging said shaft, the center portion of said sealing member having sloping surfaces that converge at the wall of said counter bore, said sealing member being symmetrical about a plane transverse to its axis; and

retaining means for retaining said push-button member within said bore;

whereby when said button is depressed said shaft contacts said watch case within said bore and contacts said contact member thereby completing an electrical path between said contact member and watch case and whereby said sealing member acts as a spring means and sealing means for said push-button assembly.

4,031,349

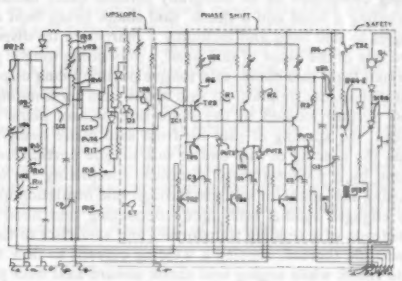
STUD WELDING CONTROL

Paul A. Glorioso, Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Sept. 19, 1975, Ser. No. 614,841

Int. Cl.² B23K 9/20

U.S. Cl. 219—98 **8 Claims**

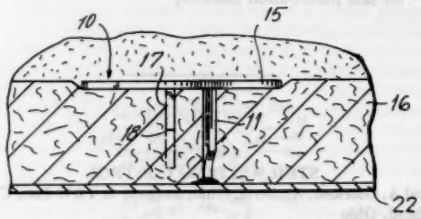


1. Apparatus for welding a stud to a workpiece comprising a multi-phase power supply, electrical means for withdrawing the stud from the workpiece when said means is energized, spring means for plunging the stud toward the workpiece when said electrical means is deenergized, means connected with said power supply, the stud, and the workpiece for supplying rectified power from said supply to the stud and the workpiece to establish a pilot arc therebetween, additional means connected with said power supply, the stud, and the workpiece for supplying rectified power to the stud and the workpiece for establishing a main welding arc therebetween, said additional means including a semi-conductor controlled rectifier for each phase of the power supply, phase control means for sequentially causing said semi-conductor controlled rectifiers to conduct at predetermined times relative to the cycles of the multi-phase power supply, said phase control means including independent means for firing each of said semi-conductor controlled rectifiers, and means for energizing said firing means including a shunt in a welding circuit for the welding current, means for receiving a signal from said shunt, and hand-manipulatable means for modulating said signal and for changing the times in the cycles of the power supply at which said firing means are energized, a timing circuit connected to said electrical means to deenergize said electrical means and to enable said spring means to plunge the stud toward the workpiece, hand-manipulatable means for controlling the actuation of said timing circuit to control the time in the welding cycle at which the electrical means is deenergized and the stud is plunged toward the workpiece, said firing means comprising capacitor means effective to cause said semi-conductor controlled rectifiers to conduct when a charge on said capacitor means reaches a given value, circuit means for controlling the charging rate of said capacitor means, and up-slope circuit means for supplying power to said circuit means.

4,031,350
METHOD OF RESISTANCE WELDING

Milton Hinden, Massapequa, and Charles Giannone, North Babylon, both of N.Y., assignors to Duro-Dyne Corporation, Farmingdale, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,640
Int. Cl.² B23K *11/04*
U.S. Cl. 219—99 1 Claim



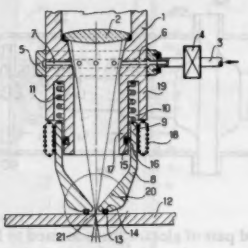
1. The method of attaching insulation to a sheet metal duct or the like utilizing a resistance welding pin, said welding pin being comprised of an integrally formed sheet metal blank including a head and a shank, said shank being bent at righ angles to said head and including a sharpened tip disposed to one side of the plane of said head, a depending tongue portion formed from said blank, said tongue portion being disposed in parallel spaced relation to said shank and terminating in an end portion located to the same side of said plane as said shank, the spacing of said tip from said plane being greater than the spacing of said end of said tongue portion from said plane by a predetermined distance, comprising the steps of passing said shank of said pin through said insulation until said tip engages against said duct, connecting said head to one electrode of a welding transformer and said duct to the other electrode thereof, causing a welding current to flow through said shank while urging said shank toward said duct progressively to melt said tip and portions of said shank adjacent said tip to effect a welded connection between said shank and said duct, and interrupting the flow of said welding current through said shank at a point not later than when said tongue portion engages said duct, said tongue portion providing a limit stop and an alternate current path for said welding current, whereby only a limited length of said shank portion may be melted.

4,031,351
HIGH ENERGY LASER BEAM CUTTING METHOD AND APPARATUS

Jean Martin, Chatillon, France, assignor to Groupement Atomique Alsacienne Atlantique, Le Plessis-Robinson, France

Continuation of Ser. No. 408,910, Oct. 23, 1973, abandoned.
This application July 28, 1975, Ser. No. 599,437
Claims priority, application France, Oct. 25, 1972, 72.37880
Int. Cl.² B23K *26/00*
U.S. Cl. 219—121 L 4 Claims

1. In a device for cutting a work piece comprising:
a cylindrical sleeve,
a laser beam source, including a frontal lens mounted within said sleeve for directing a laser beam axially through said sleeve,
a plurality of peripheral gas inlet openings within said sleeve downstream of said lens,
a source of gas under pressure coupled to said openings, the improvement comprising:
valve means for adjusting the pressure of the gas entering said cylindrical sleeve interior through said gas inlet openings,
said cylindrical sleeve terminating on the end facing said work piece and opposite said laser beam source in an axially slidable nozzle sealably carried by said cylindrical sleeve and means for spring biasing said sleeve towards extended position,
a seal ring mounted on the end of said nozzle and contacting said work piece under said spring bias, said nozzle terminating adjacent said work piece interiorly of said

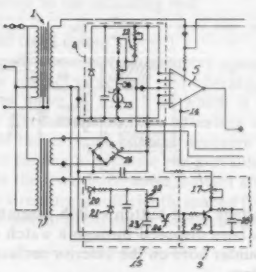


seal ring in a convergent upstream portion and a divergent downstream portion for gas discharge at the outlet of the nozzle at supersonic speed confined by the seal ring contacting the work piece;
thereby, increasing the cutting speed of the laser beam cutting device.

4,031,352
ELECTRIC BLANKET

Cedric Siegfried Oosterberg, Cape Town, South Africa, assignor to C. S. Oosterberg (Proprietary) Limited, Cape Town, South Africa

Filed Oct. 16, 1975, Ser. No. 623,105
Claims priority, application South Africa, Oct. 18, 1974, 74/6635
Int. Cl.² H05B *1/00*
U.S. Cl. 219—212 14 Claims



1. An electric blanket assembly including a blanket having elements adapted to be heated from an electric supply source and a control circuit assembly adapted to control current through the elements to regulate the heating of the blanket and further adapted to disconnect the supply source from the heating elements under conditions of malfunction of the blanket, characterised in that the control circuit assembly includes temperature sensitive elements suitably located in the blanket and arranged to generate a control voltage, timing means adapted to generate a reference voltage and regulating means

to compare the control voltage and the reference voltage and to trigger a solid state switching device which is adapted to control the current through the blanket heating elements.

4,031,353

ELECTRIC RADIANT HEATER

Eduardo Rueda Segura, Madrid, Spain, assignor to Empresa De Representaciones Unidas, S.A. (Erusa), Madrid, Spain

Filed Apr. 9, 1975, Ser. No. 566,326

Claims priority, application Germany, Apr. 11, 1974, 2417960; Apr. 11, 1974, 2417961; Apr. 11, 1974, 7412971[U]; Apr. 11, 1974, 7412972[U]

Int. Cl.² H05B *3/22*; F24D *13/02*; F24H *9/04*; H01C *1/012*

U.S. Cl. 219—345 **7 Claims**

1. An electric heater comprising:

metal heating plate having at least one curved bulged portion, each of said curved bulged portions being surrounded by a flat transversely extending peripheral flange, each of said curved bulged portions having a completely concave curved inner surface and a completely convex curved outer heat radiating surface, at least said concave curved inner surface having thereon a coating of dielectric vitrified enamel covering the whole of said concave curved inner surface and a printed circuit electrical resistance heating element deposited on said enamel coating;

a thermal reflector plate having a bulged portion surrounded by a transversely extending flange;

said heating plate and said thermal reflector plate being joined with the concavities of said heating plate and said thermal reflector plate facing each other, the thus joined heating plate and thermal reflector plate forming a heating assembly;

means for energizing said heating element for heating said heating plate to radiate heat from said convex outer surface;

means for supporting said heating assembly with said convex outer surface being exposed to a zone to be heated;

said heating plate undergoing deformation of a thermal origin upon operation of said resistance heating element; and

a peripheral transition area, adjacent the intersection of each of said bulged portions and its surrounding flange of said heating plate, said transition area being so shaped as to comprise means for imparting a stress, upon deformation of said heating plate, always compressing said enamel coating covering said concave inner surface.

4,031,354

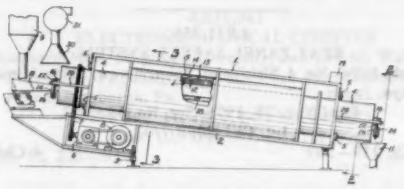
ROTARY HEATING APPARATUS FOR PUFFING BORAX

Godfrey B. D'Souza, Etobicoke, Canada, assignor to Canada Packers Limited, Toronto, Canada

Division of Ser. No. 470,295, May 15, 1974, Pat. No. 3,944,651. This application Oct. 9, 1975, Ser. No. 621,114

Int. Cl.² F27B *7/00*

U.S. Cl. 219—389 **8 Claims**



1. A borax puffing apparatus of the rotary drum type which comprises a rotary, inclined tube and a supporting frame; means for mounting said tube on said frame for rotary motion of the tube around its axis; drive means for rotating said tube around its axis; electrical heating means extending along the exterior of said tube for a major portion of its length for heating the tube to an interior temperature of from about 220° F to 450° F; a thermal insulating jacket fixed to said frame and surrounding said heating means and tube; said heating means being fixed to the interior of said jacket and being spaced from the exterior wall of said tube; an internal scraper having means bearing against an internal surface of said tube; air suction means positioned at the upper end of said tube to draw air through the tube counter current to the direction of feedstock material; feed means at the upper end of the tube and discharge means at the lower end of the tube.

4,031,355

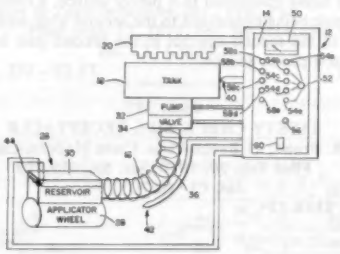
MULTI-CHANNEL TEMPERATURE RESPONSIVE PROCESS CONTROL SYSTEM

Stephen A. Leonik, Jr., 160 Sunrise Drive, Woodside, Calif. 94062

Filed Mar. 31, 1975, Ser. No. 563,911

Int. Cl.² H05B *1/02*

U.S. Cl. 219—502 **24 Claims**



1. A control system comprising:

a sensor producing electrical signals representing a controllable physical condition;

a circuit including a first integrated circuit feedback amplifier having an input connected to said sensor for amplifying said sensor signals and a second like integrated circuit feedback amplifier having an input potentiometer connected across a power supply for adjusting the input thereto for producing set condition signals;

a meter selectively connected to receive and display said amplified sensor signals and said set condition signals in terms of the condition to be controlled;

a comparator comprising a third integrated circuit feedback amplifier connected to receive said amplified sensor signals and said set condition signals and producing a difference signal therefrom;

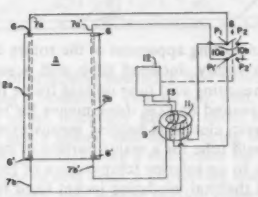
a switch connecting a power supply and an operator for affecting the condition to be controlled; and

an optical coupler applying said difference signal to control means of said switch for operating the switch to control said condition.

4,031,356
HEAT PANEL SAFETY SYSTEM

Akitoshi Niibe, No. 4 Nishikubo, Sakuragawa, Shiba Minato,, Tokyo, Japan

Filed Nov. 20, 1975, Ser. No. 633,653
Int. Cl.² H05B 1/02
U.S. Cl. 219—509 **4 Claims**

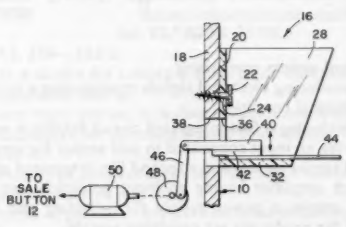


1. Safety heating panels apparatus comprising a sheet dielectric first and second electrodes connected to the sheet in spaced relationship between the electrodes, each electrode having spaced terminals connected to the electrode, electrical conductive heating layer on said dielectric sheet and connected between the electrodes, a first wire having ends connected to terminals on the first electrode and at least one turn in the first wire between its ends, a second wire having ends connected to terminals of the second electrode, and having a turn in the second wire, core means adjacent the turns, a relay having power terminals, and a relay wire connected to the power terminals and having a turn adjacent the core means, circuit breakers connected to the relay, whereby the relay operates the circuit breakers upon energization of the relay wire, the circuit breaker having first and second pairs of contacts and separate means to complete circuits between contacts in the first and second pairs, a contact in the first pair being connected to the first wire and a second contact in the first pair being connected to a power source, a contact in the second pair being connected to the second wire, and a second contact in the second contact in the second pair being connected to a power source.

4,031,357
SAFETY CHECK BILL RECEPTACLE

Wayne R. Brand, 21 Buena Vista, Corte Madera, Calif. 94925

Filed Feb. 20, 1976, Ser. No. 659,719
Int. Cl.² G07G 1/00
U.S. Cl. 235—12 **3 Claims**

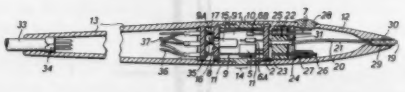


1. A receptacle for cash register comprising a rear wall adapted to be mounted on the exterior of the front plate of said register, and a bottom shelf secured to said rear wall, said rear wall including a slot along said bottom shelf, said slot being adapted to receive a paper money bill, said front plate of said register including a matching slot, said rear wall slot being aligned with said matching slot, said register including means for holding a paper money bill on said bottom shelf and for drawing said bill into said register, said means for holding and drawing said bill including an arm extending through said slots and adapted to contact a bill on said shelf, a motor and linkage connected to said arm to draw said arm and bill into said register, and a button on said register for actuating said motor upon completion of a sales transaction, said receptacle including two side walls at opposite ends of said rear wall and bottom shelf, a central partition and a front wall between said partition and one side wall, said slot being positioned between said partition and the other side wall, the portion of said receptacle with said front wall providing a tray for holding articles.

4,031,358
OPTICAL CODE READERS

Brian Robert Thornley, Wimborne Minster, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed July 1, 1975, Ser. No. 592,264
Claims priority, application United Kingdom, July 3, 1974, 29423/74
Int. Cl.² G01N 21/30; G06K 7/10
U.S. Cl. 235—61.11 E **3 Claims**



1. A probe for scanning optically encoded data comprising a generally tubular housing including a light source, a reading head fitting slidably within the tubular housing, a plurality of optical fibres forming a light guide means wherein the optical fibres are positioned and arranged to bias by reason of their natural springiness the said reading head so that its tip is constrained normally to project from the said housing, and an optical detector arranged within the tubular housing, said light source and said optical detector being optically coupled via said optical fibres to said tip of said reading head so that light is transmitted from said light source via said fibres to illuminate data scanned and so that light reflected from data thus illuminated is returned from said tip of said reading head along another of said fibres to be received at said optical detector.

4,031,359
STRAIGHT LINE READ SYSTEM

Kyriakos Christou, Livonia; Karlis Kruklitis, Plymouth, and William R. Burger, Livonia, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 18, 1975, Ser. No. 642,061
Int. Cl.² G06K 13/07; G11B 25/04
U.S. Cl. 235—61.11 D **42 Claims**

1. A document read system disposed on a base member and having a write and read MICR head for writing and reading characters on a document comprising:

a. means defining a linear path through which the documents may be throughputted, and for operatively mounting therein the write and read MICR heads to face the documents in said linear path defining means;

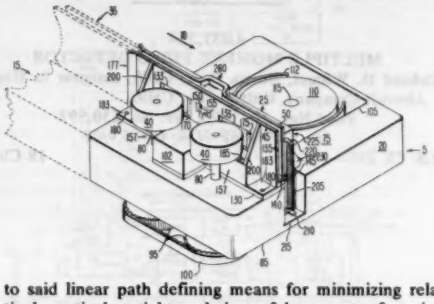
b. first wall means fixably disposed on the base member for establishing one side of the document flow in said linear path defining means;

c. second wall means pivotally disposed on the base member for establishing the other side of the document flow in said linear path defining means and for providing spring-

loaded release and return for easy tactile access to documents in said linear path defining means;

d. means disposed on the base member for driving the documents to be throughputted in said linear path defining means at a relatively constant speed;

e. means disposed on said linear path defining means for maintaining good registration on the documents relative



to said linear path defining means for minimizing relatively vertical spatial translations of documents of varying widths; and

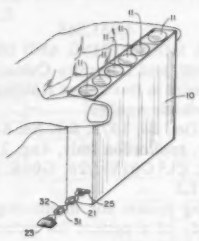
f. means disposed on the base member for enabling the document in said linear path defining means as it is throughputted by said driving means to be in close proximity to the write and read MICR heads for positive communative contact therewith.

4,031,360

ELECTRONIC READ OUT TAPE MEASURE

Gustave H. Soule, Jr., Franklin, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 17, 1975, Ser. No. 632,529
Int. Cl.[2] G06M *3/14*; G01B *3/12*
U.S. Cl. 235—92 DN **1 Claim**



1. A tape measure device incorporating a flexible tape mounted on a spring-biased rotatable reel in a housing, said housing enclosing an electric calculator connected to an electronic digital display unit, with said calculator connected to means to sense the length of tape extended out of said housing in terms of a total of discrete units, and with said calculator incorporating means to cause the electronic digital display unit to display the said total of discrete units,

said tape fabricated of joined individual links, with each link perforated by a through hole of a size to fit over a tooth of a sprocket wheel rotatably mounted in said housing, with the links of said tape engaged about the sprocket wheel so as to cause the sprocket wheel to rotate in direct proportion to the travel of said tape into or out of said housing,

said sprocket wheel rotatably linked to switching means which transmit pulses of electrical current to said calculator in response to the rotation of said sprocket wheels, the number of said pulses being directly proportional to the degree of rotation of the sprocket wheel and the polarity of said pulses being responsive to the direction of rotation of said sprocket wheel,

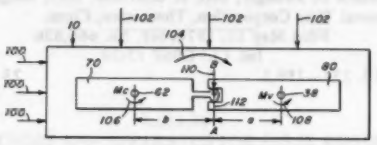
such that the calculator controls the elctronic digital display unit to display a numeral representing a length of tape extended out of the housing, said numeral being the sum of pulses of a first polarity minus the sum of pulses of the reverse polarity.

4,031,361

ELECTROMECHANICAL COUNTER

Eberhard Moll, Magstadt, Germany, and Leo M. Walch, Jr., Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 14, 1976, Ser. No. 648,855
Int. Cl.[2] G06M *1/06, 3/12*
U.S. Cl. 235—92 C **5 Claims**



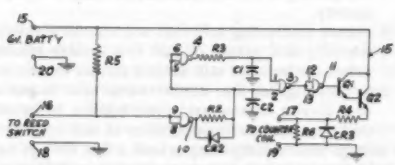
1. An electrically operated counting mechanism comprising a counter, a clapper mounted for pivotal movement about a first axis, means to induce pivotal movement of said clapper about said first axis in response to an electric signal, a verge mounted for pivotal movement about a second axis parallel to and spaced from said first axis, means drive connecting said verge to said counter to operate said counter in response to pivotal movement of said verge about said second axis, means interconnecting said clapper and said verge at a point intermediate said first and second axes whereby pivotal movement of said clapper in one direction will cause pivotal movement of said verge in the opposite direction, the centers of gravity of said clapper and said verge being in substantially the same plane as the plane containing said first and second axes.

4,031,362

ELECTRONIC REMOTE READING SYSTEM FOR A METER

Richard D. Brugger, and Joseph A. Barna, both of Erie, Pa., assignors to Zurn Industries, Inc., Erie, Pa.

Filed Sept. 17, 1975, Ser. No. 614,192
Int. Cl.[2] G06M *3/12*
U.S. Cl. 235—92 FL **14 Claims**



1. A remote reading system for measuring the flow of a product comprising,

an instrument having shaft means moveable in proportion to the flow of said product, contact means,

actuating means on said shaft means adapted to close and open said contact means in response to movement of said shaft,

an electrical circuit connected to said contact means and connected to a counter means for counting the number of times said contact is closed,

said electrical circuit having a power source connected thereto,

said circuit having means comprising an electronic valve connecting said power source to said counter means,

a control element on said electronic valve,

and electronic pulse forming means connected to said contact means and to said control element causing said electronic vaive to respond to said closing of said contact and put out a pulse of relatively short duration to said counter when said contact goes from open to closed position and put out no pulse when said contact moves from closed to open position, whereby energy flows from said power source through said electronic valve into said counter during the time of said pulse only.

4,031,363

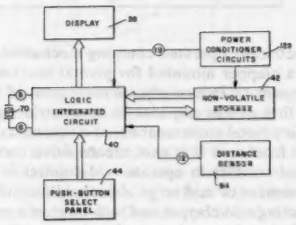
DISPLAY APPARATUS FOR AUTOMOTIVE VEHICLES

John D. Freeman, Westport, Conn.; Ralph C. Robinson, and Kenneth D. Swonger, both of Charlotte, N.C., assignors to General Time Corporation, Thomaston, Conn.

Filed May 17, 1976, Ser. No. 686,826

Int. Cl.² G06F *15/20*

U.S. Cl. 235—150.2 **23 Claims**



1. A system for automotive vehicles adapted both for providing automatically at least a display representing a time function in minutes and hours and upon manual activation a different display to advise the operator of said automotive vehicle of the state of a selected one of a plurality of other functions which periodically are changing, said system comprising:

a. circuit means including

1. a source of a first input frequency,

2. first divider means connected to said source providing an output which is of a frequency comprising a division of said first input frequency,

3. second divider means having an output of a frequency comprising a further division of said first input frequency,

4. means connecting said first and second divider means whereby said output of said first divider means comprises the input of said second divider means, and

5. a time register also connected to said output of said first divider means, said time register being continuously updated during operation of said system;

b. storage means comprising at least a first storage network, said first storage network connected to said second divider means thereby both to receive said output of said second divider means and store information so that said first storage network continually represents the then present condition of one of said plurality of other functions;

c. a display adapted normally to display said time function and upon command to discontinue said normal display and to display said selected one of said plurality of other functions;

d. means connecting each of said storage means and time register to said display, said connecting means including

1. control means included between said display and storage means for gating said selected one of said plurality of other functions to said display and isolating all other functions from said display;

e. means for activating said control means; and

f. power means for energizing each of said circuit means, storage means and display.

4,031,364

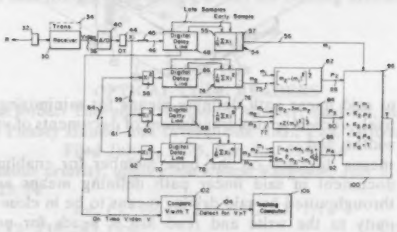
MULTIPLE MOMENT VIDEO DETECTOR

Richard D. Wilmot, Buena Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 10, 1975, Ser. No. 630,592

Int. Cl.² G06F *7/38*; G01S *9/02*

U.S. Cl. 235—151.3 **18 Claims**



1. A detector system responsive to a source of signals of a statistically varying frequency of occurrence distribution comprising:

first means responsive to said source of signals for generating in parallel a plurality of r moments of said varying distribution; and

second means coupled to said first means for multiplying each moment by a selected constant and combining said moments to develop a threshold signal.

4,031,365

TEMPERATURE MONITORING AND DISPLAY SYSTEM

Guglielmo Raggiotti, and Domenico Colonnelli, both of Perugia, Italy, assignors to Itus Patent Holding (IPH) N.V., Willemstad, Netherlands Antilles

Filed Oct. 14, 1975, Ser. No. 621,915

Claims priority, application Italy, Aug. 21, 1975, 51020/75

Int. Cl.² G01V *1/28*; G01K *7/00*

U.S. Cl. 235—151.3 **12 Claims**

1. A monitoring system for monitoring the temperature levels of the body of a patient for extended periods, said system comprising:

transducer means for sensing the temperature of the body of the patient under observation and for producing an output voltage in accordance therewith,

a voltage controlled oscillator for producing an output whose frequency varies in accordance with the output voltage of said transducer means,

an n-bit binary coded counter connected to said voltage controlled oscillator for producing an n-bit binary coded output representative of the temperature sensed,

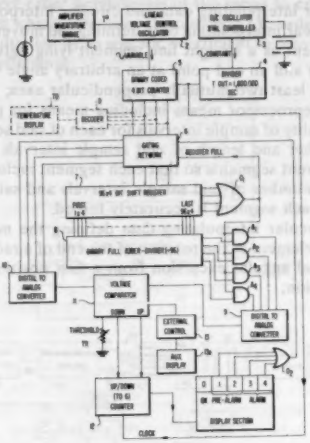
gating means,

a shift register controlled by said gating means for storing the n-bit binary coded output of said counter over N cycles, said N cycles being repeated and said counter producing an N + 1 output following the Nth output thereof,

an adder-divider circuit connected to the outputs of said register for summing N outputs stored thereby and for dividing the resultant sum by N to produce a digital signal representative of the arithmetic average of said N outputs,

comparator means for comparing the output of said adder-

divider circuit with the N + 1 output of said counter and for producing a first "normal" output when the difference between said outputs is less than a positive threshold level



and for producing a second "abnormal" output when said difference exceeds said threshold level, and

display means connected to the output of said comparator means.

4,031,366

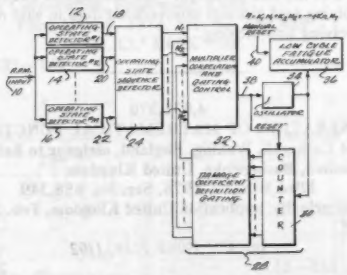
LOW CYCLE FATIGUE DAMAGE COUNTER

Robert L. Hartung, Fort Worth, Tex., assignor to Howell Instruments, Inc., Fort Worth, Tex.

Filed Oct. 30, 1975, Ser. No. 627,458

Int. Cl.² G01V *1/28*; G01M *7/00*

U.S. Cl. 235—151.3 **16 Claims**



1. Apparatus for detecting and indicating cumulative low cycle fatigue damage done to a rotating member due to the sequential passage of said member through different operating states, said apparatus comprising:

input means for providing an electrical input signal representative of the existing operating state of said rotating member.

classification means connected to receive said input signal for detecting which of a plurality of predetermined operating states is then in occurrence and for producing a respectively corresponding output in response to detection of each different operating state,

sequence detection means for receiving the output from said classification means and for detecting which of a plurality of predetermined sequences of operating states have occurred and for producing a respectively corresponding output in response to detection of each different predetermined sequence of operating states,

damage coefficient determining and correlation means operatively connected to receive the output from said sequence detection means for defining a predetermined constant number of each said predetermined plurality of sequences and for respectively associating each of said constant numbers and said sequences, and

acccumulator means connected to the output of the damage coefficient determining and correlation means for receiving therefrom electrical signals representing the constant number corresponding to the detected predetermined sequence of operating states and to cumulatively add and totalize such constant numbers thereby providing an indication of cumulative low cycle fatigue damage done to the rotating member.

4,031,367

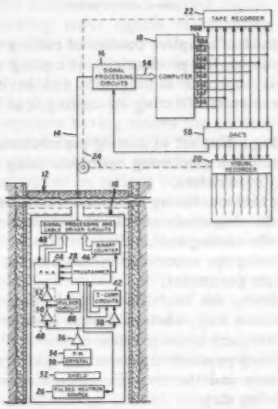
METHODS AND APPARATUS FOR PULSE HEIGHT ANALYZER OFFSET CONTROL

Richard D. Murphy, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,510

Int. Cl.² G01V *5/00*

U.S. Cl. 235—151.3 **23 Claims**



1. Apparatus for generating test pulses useful in controlling offsets in the analog input/digital output relationship of a pulse height analyzer over a certain temperature range, comprising:

switching circuit means responsive to a command signal for generating a first pulse;

means coupled to the switching circuit means for attenuating the first pulse by a predetermined factor which is substantially constant over said temperature range to produce a second pulse;

means coupled to the switching circuit means and to the pulse attenuating means for passing the first and second pulses in a predetermined sequence; and

impedance buffer means, having substantially stable temperature offset characteristics over said certain temperature range, for converting the first and second pulses passed by the pulse passing means into first and second test pulses of a predetermined shape for application to a pulse height analyzer, whereby the amplitude ratio of the first and second test pulses produced by the buffer means is substantially stable over said temperature range.

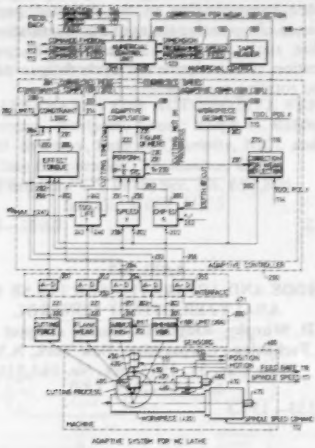
4,031,368
ADAPTIVE CONTROL OF CUTTING MACHINING OPERATIONS

Bertil Colding, Stockholm; Arne Novak, Vallingby; Unto Sandstrom, and Goran Jakobsson, both of Stockholm, all of Sweden, assignors to Verkstadsteknik AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 244,607, April 17, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 441,709

Int. Cl.² B23Q *15/00*; G05B *13/02*; G06F *15/46*

U.S. Cl. 235—151.11 **28 Claims**



1. A method of adaptive control of cutting machine operations to optimize the productivity of cutting machine means including at least one cutting tool and having controllable cutting parameters affecting its cutting tool comprising the steps of:

a. selecting a first set of cutting parameters,

b. performing a machining operation using said first set of cutting parameters,

c. during said machining operation measuring a plurality of times the magnitude of at least one wear-related parameter of the cutting tool,

d. comparing the successive measurements of said at least one wear parameter,

e. calculating the tool life by projecting, based on said comparison step, when said wear parameter will reach a predetermined limiting value,

f. calculating productivity based on said first set of cutting prameters and the tool life calculated in said tool life calculating step,

g. optimizing productivity by selecting further sets of said cutting parameters, and calculating for each set the corresponding tool life, and the productivity resulting from said further sets of cutting parameters and said corresponding tool life,

h. selecting from the optimized productivity value the desired set of cutting parameters.

4,031,369
INTERPOLATION AND CONTROL APPARATUS AND METHOD FOR A NUMERICAL CONTROL SYSTEM

James Patrick Heaman, Westland, Mich., and James Anthony Michaud, Bellbrook, Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 12, 1975, Ser. No. 603,986

Int. Cl.² G05B *19/30*; G06F *15/46*

U.S. Cl. 235—151.11 **7 Claims**

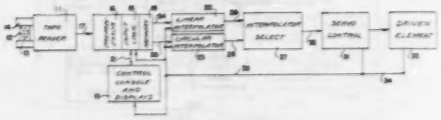
1. A numerical control system for controllably moving an element along a motion path of arbitrary configuration; said system including means for receiving data numerically defining said motion path from a storage medium, system logic for preprocessing and interpolating said data, and means for receiving said data from said system logic and moving said element along said path, said system logic including:

preprocessor means for receiving said data and providing linear interpolating data and circular interpolating data;

said linear interpolating data defining the movement of said element as a straight line segment lying between a start point and an end point at an arbitrary angle with respect to at least two mutually perpendicular axes;

said preprocessor means including means for generating a plurality of sample intervals for each of said segments, the number and length of said sample intervals varying for different segments so that each segment includes an integral number of said sample intervals and said end point for each segment is accurately forced;

said circular interpolating data defining the movement of said element as the rotation of the end of a radius through a total angular excursion from a first position to a final position;



said preprocessor means including means for generating a plurality of subangular excursions for each of said angular excursions, the number and extent of said subangular excursions varying for different angular excursions so that each angular excursion includes an integral number of said subangular excursions and said final position for each angular excursion is accurately forced;

linear interpolating means receiving said linear interpolating data for generating linear interpolated data indicative of the end points for each liner sample interval and apply said linear interpolated data to said means for receiving and moving;

circular interpolting means receiving said circular interpolating data for generating circular interpolated data indicative of the end points for each subangular excursion and applying said circular interpolated data to said means for receiving and moving.

4,031,370
GENERATION OF MATHEMATICAL FUNCTIONS

Reginald Catherall, Woking, England, assignor to Bell & Howell Limited, Basingstoke, United Kingdom

Filed Feb. 17, 1976, Ser. No. 658,349

Claims priority, application United Kingdom, Feb. 26, 1975, 8134/75

Int. Cl.² G06F *7/38*, *1/02*

U.S. Cl. 235—152 **29 Claims**

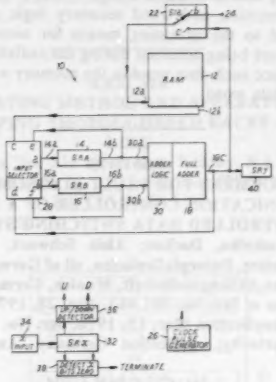
1. A method of interpolating a value of the dependent variable y corresponding to a given value of an independent variable x, wherein y is a function of x and is described by a linear polynomial series of the $2n$th order wherein each term of the series comprises the product of a linear polynomial of x and a coefficient, and the terms of the linear polynomial series containing the $(n+1)$th to the $2n$th polynomials are in the form of an expression which is a product of a common nth order polynomial of x, and the sum of the zero'th to the nth order polynomial each multiplied by its appropriate coefficient, using an nth order polynomial interpolation method to obtain up to a $2n$th order interpolation in 2 iterations of the nth order interpolation method, the method comprising the steps of:

determining the coefficients for each of the terms of the linear polynomial series;

using the determined appropriate coefficients relevant to the $(n+1)$th to the $2n$th polynomials to perform an nth

order interpolation to obtain a specific coefficient for the common *n*th order polynomial at a given value of the independent variable *x*;

modifying, as required the coefficients relevant to the *n*th and lower order polynomials of the series to consolidate the term which comprises the common *n*th order polynomial multiplied by its specific coefficient to provide modified coefficients;



and performing a second *n*th order interpolation using the modified coefficients at the given value of the independent variable *x*;

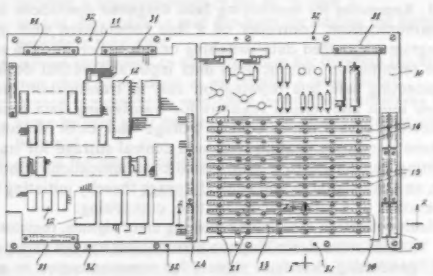
whereby the result of the second interpolation is the value of the dependent variable *y* for the given value of the independent variable *x* which would have been obtained by using a higher order interpolation method up to the 2*n*th order.

4,031,371

MICROCOMPUTER BOARD HAVING WIRE-WRAP TERMINALS

Hubert G. DeVries, Littleton, Colo., assignor to Monolithic Systems Corporation, Englewood, Colo.

Filed Mar. 8, 1976, Ser. No. 664,815
Int. Cl.² H05K 7/08
U.S. Cl. 235—152 **11 Claims**



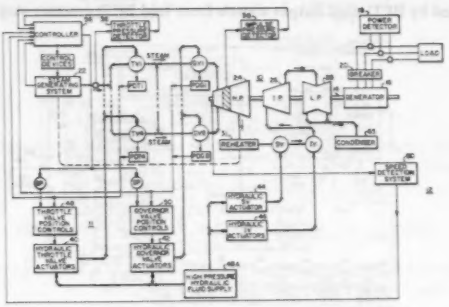
1. A microcomputer board comprising an insulating mounting board, first microcomputer components fixedly mounted to said insulating mounting board in a first area thereof, first and second pluralities of connector means having wire-wrap pins and fixedly mounted to said insulating mounting board, at least a pair of parallel rows of holes in said board in a second area thereof, individual connectors having wire-wrap pins mounted in said holes, and printed circuit means on said insulating mounting board interconnecting said microcomputer components and said first plurality of connector means and not extending directly to said individual connectors and said second connector means.

4,031,372

SYSTEM FOR MANUALLY OR AUTOMATICALLY TRANSFERRING CONTROL BETWEEN COMPUTERS WITHOUT POWER GENERATION DISTURBANCE IN AN ELECTRIC POWER PLANT OR STEAM TURBINE OPERATED BY A MULTIPLE COMPUTER CONTROL SYSTEM

Guy E. Davis, Martinez, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1973, Ser. No. 413,278
Int. Cl.² F01D 17/02; G05B 15/00; G06F 15/06
U.S. Cl. 235—151.21 **84 Claims**



1. A control system for an electric power plant having at least one steam turbine and a steam generator, said control system comprising multiple digital computers including at least a first digital computer and a second digital computer, means for generating input signals representing predetermined process variables associated with said steam generator, means for generating input signals representing predetermined process variables associated with said steam turbine, means for coupling the input signals to both of said computers, each of said computers having means for controlling its sequential programmed operation and including substantially identical control elements which generate control outputs as a function of input signals in various control loops to operate controllable elements of said steam generator and throttle and governor valves of said steam turbine, means for sensing predetermined control system malfunctions, means for coupling the outputs of one of said computers to operate the steam generator controllable elements and turbine valves, means for substantially conforming the structure of the other computer to the structure of said one computer in real time, said conforming means including means for responding to predetermined process input signals to control the operation of at least some of said computer control elements in a tracking mode and generate corresponding control outputs in said other computer substantially equal to those from said one computer, and means for executing a transfer in the control of the steam generator and the turbine from said one computer to said other computer substantially without disturbing the power generation when said sensing means detects a control system malfunction.

4,031,373

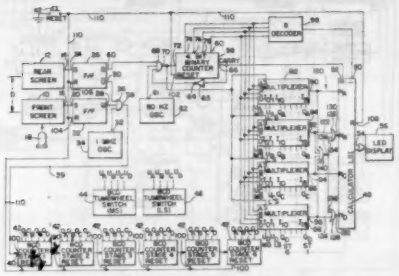
VELOCITY COMPUTING CHRONOGRAPH

Robert Beckwith, R.R. 1, Box 1058, Marathon, Fla. 33050

Filed June 1, 1976, Ser. No. 691,327
Int. Cl.² G01N 23/10; G06M 3/06
U.S. Cl. 235—151.32 **1 Claim**

1. A projectile velocity measuring and computing system having front and rear projectile sensing screens having outputs indicative of the passage of a projectile therethrough the apparatus comprising: a first oscillator; a chain of BCD counter stages; means responsive to the outputs of said screens for coupling said oscillator for clocking said chain of

counters only during the time of flight of said projectile from the front to the rear screen means; a group of BCD coded numerical switches for manual entry of the distance between said pair of screens; an electronic digital display; a digital calculator integrated circuit having data input terminal means for serially receiving BCD digit signals, a divide command input terminal, an equals command input terminal and output means for driving said electronic digital display with the result of computation in said calculator means; means responsive to the output of said rear screen including a second oscillator and a binary counter for deriving a series of binary coded sequential numerical control signals after the flight of said projectile between said front and rear screen means; multiplexer means fed by BCD digit output signals from said BCD counter stages



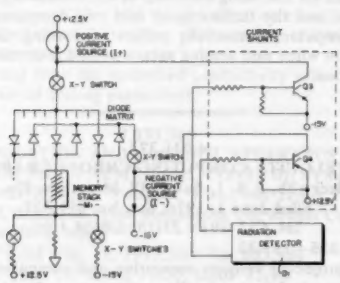
and numerical switches and feeding said data input terminal means of said calculator means for selectively applying different ones of said BCD digit output signals to said data input terminal means in response to the digital state of said numerical control signals, said multiplexer means being organized for serially applying first said BCD digit signals from said numerical switches and then from said BCD counter stages in response to the sequential numerical control signals, there being at east one predetermined numerical control signal state between the application of said BCD digit signals from said BCD coded numerical switches and from said BCD counter stages; means responsive to said predetermined control signal state for driving said divide command input terminal; and means responsive to the occurrence of a last of said numerical control signals for driving said equals command input terminal.

4,031,374

ERROR CORRECTION SYSTEM FOR RANDOM ACCESS MEMORY

Alan I. Groudan, Harrington Park; George F. Schroeder, and H. Lee Treffinger, both of Wayne, all of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Dec. 24, 1974, Ser. No. 536,142
Int. Cl.² G11C *29/00*; G06F *11/10*
U.S. Cl. 235—153 AM **16 Claims**



1. A protective system to prevent data word losses in a random access memory in the presence of a radiation pulse from a nuclear radiation event, or the like, which memory includes a multiplicity of individual memory elements and associated selective and read/write circuitry; the combination of:

circumvent circuitry coupled to the selective and read/write circuitry for protecting all unaddressed memory elements in the memory in the event of a radiation pulse;

accessing means coupled to the memory for selectively accessing the data words in the memory at the different memory locations therein; and

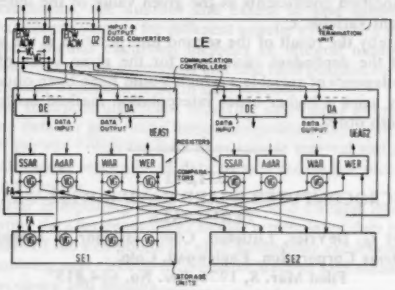
error correction and word recovery logic circuit means coupled to the accessing means for reconstituting the data word being accessed during the radiation pulse so as to replace such data word in the memory with a reconstituted date word.

4,031,375

ARRANGEMENT FOR FAULT DIAGNOSIS IN THE COMMUNICATION CONTROLLER OF A PROGRAM CONTROLLED DATA SWITCHING SYSTEM

Gerhard Jaskulke, Dachau; Alois Schwarz, Munich, and Armin Rutter, Unterpfaffenhofen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 501,463, Aug. 28, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,583
Claims priority, application Germany, Aug. 29, 1973, 2343586
Int. Cl.² G06F *11/04*
U.S. Cl. 235—153 AK **7 Claims**



1. Apparatus for monitoring fault diagnosis operations in a communications controller of a line termination unit in a program controlled data switching center, wherein each said line termination unit includes data input and output devices connecting said line termination unit to transmission lines, word input and output registers for transferring data to and receiving data from a central storage and error detecting means in communication with said central storage for transmitting, responsive to a fault in said communications controller, an error signal to said central storage thereby initiating the operation of a safeguarding routine, comprising:

fault collection means for receiving error signals, registering a fault word describing the error which has occurred and generating first fault signals for communication to said communications controller and second fault signals for communication to said central storage,

diagnostic routine means in said communication controller and including a first decoding means coupled to a said word input register for receiving diagnosis commands issued responsive to said safeguarding routine and for generating, responsive thereto, first control signals and including second decoding means for operating responsive to said first control signal for decoding said diagnosis commands and producing corresponding second control signals,

intermediate buffer storage means in said communication controller,

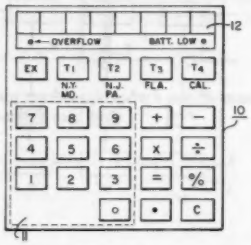
first means for connecting, responsive to said first control signals, to said input word register, said fault word register and said intermediate buffer storage means to said word output register, and

second means for connecting, responsive to said second control signals, components of said communication controller individually to a said word input register for accepting further instructions and to a said word output register for transferring information to said central storage.

4,031,376
CALCULATING METHOD AND APPARATUS FOR HANDICAPPING THOROUGHBRED RACES AND THE LIKE

Samuel Corkin, Jr., 339 Davis Ave., Kearny, N.J. 07032

Filed June 30, 1975, Ser. No. 579,942
Int. Cl.² G06F 7/38
U.S. Cl. 235—156 **14 Claims**



1. A calculator of the digital type particularly adapted for indicating a rating of an entry in a racing contest by operating on the past performance of said entry as regarding past wins (W), past seconds (S) and past thirds (T) and total monies earned by said entry in said past performances, comprising:

a. a keyboard for keying in a code having a given number of digits of a predetermined length indicative of past wins (W), past seconds (S) and past thirds (T),

b. means responsive to said code for multiplying said keyed digits associated with said wins W, said seconds S and said thirds T each by a separate corresponding factor, to provide a separate product for W. S. and T,

c. means responsive to said products for adding the same to provide a total sum,

d. means responsive to said total sum for dividing the same into unity to produce at an output, a class factor,

e. means responsive to said class factor for multiplying the same by said total monies earned to obtain a rating number, and

f. means for displaying said rating number.

4,031,377
FAST MULTIPLIER CIRCUIT EMPLOYING SHIFT CIRCUITRY RESPONSIVE TO TWO BINARY NUMBERS THE SUM OF WHICH APPROXIMATELY EQUALS THE MANTISSA OF THE MULTIPLIER

Ralph Deutsch, Sherman Oaks, and Glen R. Griffith, Westminster, both of Calif., assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

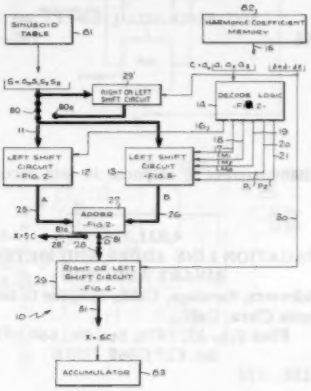
Filed Aug. 25, 1975, Ser. No. 607,141
Int. Cl.² G06F 7/54
U.S. Cl. 235—164 **11 Claims**

1. A multiplier circuit for multiplying a binary fixed point multiplicand by a binary floating point multiplier, comprising:

decode logic means, connected to receive the mantissa of said floating point multiplier, for providing control signals indicative of two binary numbers the sum of which is approximately equal to the value of said mantissa, each of said two numbers being a power of two,

a first left shift circuit means connected to said decode logic means and responsive to one of the control signals therefrom, for left shifting said multiplicand by a number of places corresponding to the first of said two numbers,

a second left shift circuit connected to said decode logic means and responsive to other of the control signals therefrom, for left shifting said multiplicand by a number of places corresponding to the second of said two numbers,



an adder, connected to both said first and second left shift circuits, for adding together the shift products thereof, and

another shift circuit for shifting a binary number by a number of places corresponding to the power of said floating point multiplier, said shifting being to the right for a negative power and to the left for a positive power, said other shift circuit being connected to said adder for shifting the sum received from said adder, the shifted output of said other shift circuit being the multiplication product.

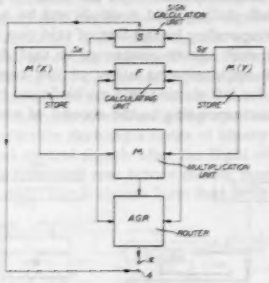
4,031,378
METHOD AND APPARATUS FOR FAST MULTIPLICATION INCLUDING CONVERSION OF OPERAND FORMAT

Michel L. Le Comte, Longjumeau, France, assignor to Jeumont-Schneider, Puteaux, France

Filed June 26, 1975, Ser. No. 590,509
Claims priority, application France, June 28, 1974, 74.22575
Int. Cl.² G06F 7/52
U.S. Cl. 235—164 **22 Claims**

1. A fast-multiplication digital system comprising at least one multiplier for multiplying two binary numbers each number comprised of a plurality of digits having differing significance and weights, each multiplier comprising means for converting each of the two binary numbers into a first amplitude number having a sign, each of said first amplitude numbers comprising the most significant digits of said binary number, the first digit being the most significant non-zero digit of said binary number, and into a second shift number having an amplitude indicative of a weight shift of the binary number before and after conversion to a predetermined format and a sign indicative of a direction of said weight shift, the system further comprising means for multiplying the first amplitude numbers of the two binary numbers and for producing a first resultant number corresponding to the multiplication of said first amplitude numbers, means for algebraically adding the second shift numbers of the two binary numbers and for pro-

ducing a second resultant number corresponding to the addition of said second shift numbers, and means for shifting said



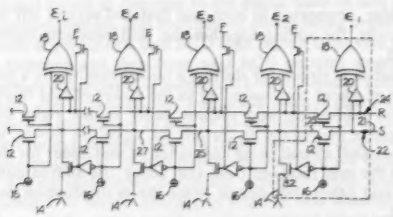
first resultant number in response to said second resultant number.

4,031,379

PROPAGATION LINE ADDER AND METHOD FOR BINARY ADDITION

Samuel Schwartz, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 23, 1976, Ser. No. 660,693
Int. Cl.² G06F 7/50
U.S. Cl. 235—175 **21 Claims**



1. A binary adder for adding at least two multiple bit binary numbers comprising:

a conductive reference propagation path having a plurality of segments;

a conductive sense propagation path having a plurality of segments;

a plurality of gating means in series with said reference and sense propagation paths, said gating means for selectively coupling said segments of said reference propagation path together and for selectively coupling said segments of said sense propagation path together;

a plurality of product circuit means corresponding to a plurality of orders of bits of said multiple bit binary numbers, each product circuit means for generating a product signal of a corresponding order of bits of said multiple bit binary numbers and for coupling said product signal to that segment of said sense propagation path corresponding to the next higher order of bits;

a plurality of summing circuit means corresponding to a plurality of orders of bits of said multiple bit binary numbers, each summing circuit means for generating a sum signal of a corresponding order of bits of said multiple bit binary numbers and for coupling said summing signal to selected ones of said plurality of gating means; and

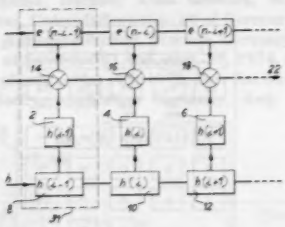
a plurality of output circuit means, each output circuit means coupled to one of said summing circuit means and coupled with selected segments of said sense propagation path, each of said output circuit means for generating an output signal in response to said sum signal and charged state of a corresponding segment of sense propagation path.

4,031,380

METHOD AND DEVICE FOR THE INTEGRATION OF ANALOG SIGNALS

Luc Audaire, St.-Nizier-du-Moucherotte; Joseph Borel, Echirolles; Vincent Le Goascoz, Claix, and Robert Poujois, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 464,879, April 29, 1974, Pat. No. 3,956,624. This application Sept. 15, 1975, Ser. No. 613,373
Claims priority, application France, May 4, 1973, 73.16246
Int. Cl.² G06G 7/18
U.S. Cl. 235—183 **3 Claims**



1. A method of integration of an analog signal in integrated circuit memory elements, wherein the memory elements are constituted by field-effect transistors having a number of layers of different dielectrics between the gate and the doped semiconductor substrate of the transistor, comprising the steps of performing a discrete sampling of the analog signal at N points, storing the N amplitudes corresponding to the N points in the form of threshold voltages in N of said transistors, then storing the amplitudes corresponding to N points of successive sampling of the analog signal in one transistor by successively adding those amplitudes to the threshold voltage of said one transistor, and reading the resultant threshold voltage of said one transistor as the result of the integration.

4,031,381

ILLUMINATABLE UMBRELLA

Phyllis Carver, 1815 Allison Road, Vancouver 8, British Columbia, Canada

Filed Mar. 8, 1976, Ser. No. 664,932
Int. Cl.² F21V 33/00
U.S. Cl. 240—6.42 **4 Claims**

1. An illuminatable umbrella comprising:

a hollow tubular shaft;

a hub slidably mounted on said shaft and having electrical conductor means on an inner portion thereof, said hub pivotably carrying a plurality of rib elements which support an umbrella hood;

means for mounting an electric bulb at one end of said shaft;

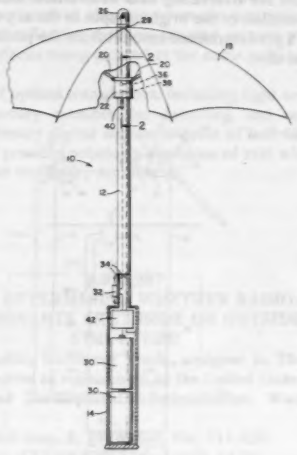
at least one battery mounted within said hollow shaft;

a manually operable electric switch carried by said shaft;

electrical conductor elements positioned within said shaft connecting said switch, batteries and bulb in a series circuit;

and a pair of electrical contacts interposed in said series circuit adjacent the external surface of said shaft cooper-

able with said electrical conductor means on said hub, whereby upon engagement of said contacts by said elec-



trical conductor means said switch can be manipulated to selectively energize said bulb.

4,031,382

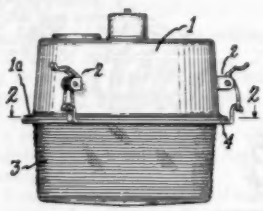
LUMINAIRE ASSEMBLY

Clifford M. Laughter, Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.

Filed June 24, 1976, Ser. No. 699,737

Int. Cl.² F21S *1/10, 3/10, 13/10*

U.S. Cl. 240—25 **9 Claims**



1. A luminaire comprising, in combination, a housing having an open bottom, a plurality of circumferentially spaced latches secured to said housing, a globe having an open top arranged closing the open bottom of said housing, said globe having an outwardly projecting rim extending around its open top, a ring member extending around said globe engaging the underside of said rim, said ring member having a plurality of circumferentially spaced hooks respectively detachably engaged by said latches, and means associated with one of said hooks for retaining the latch in engagement with said one hook whereby the latter hook with associated latch captively hingedly secures said globe to said housing.

4,031,383

METHOD FOR DETECTING VISIBILITY OF IMAGE OF AN OBJECT AND A DEVICE THEREFOR

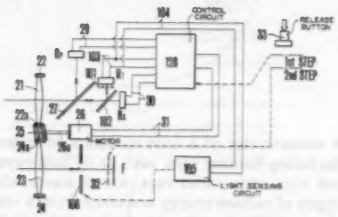
Kazuya Hosoe; Hiroshi Aizawa, both of Machida; Seiichi Matsumoto, Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1974, Ser. No. 515,015

Claims priority, application Japan, Oct. 19, 1973, 48-117552; Oct. 19, 1973, 48-117553; Oct. 19, 1973, 48-117554; Oct. 19, 1973, 48-117555; Oct. 23, 1973, 48-119280; Oct. 26, 1973, 48-120553; Oct. 26, 1973, 48-120554

Int. Cl.² G01J *1/20;* **G03B** *7/08*

U.S. Cl. 250—201 **32 Claims**



1. A system for detecting the sharpness of an object image, comprising:

an image forming optical system forming an image of an object;

first photoelectric transducing means which receives the object image formed by said optical system and presents an electrical output which corresponds to the sharpness of the image, said first transducing means placed at a position capable of receiving the object image formed by said optical image and having:

a first photosensitive element of a slender strip shape, and

a first pair of electrodes connected to short sides of said element;

second photoelectric transducing means which receives the object image formed by said optical system and presents an electrical output which corresponds to the sharpness of the image, said second transducing means being placed at a position capable of receiving the object image formed by said optical system and having:

a second photosensitive element of a slender strip shape, and

a second pair of electrodes connected to long sides of said second element;

electrical circuit means to electrically process the output of said first and second transducing means and output image sharpness information based on the output of said first and second transducing means; and

correcting means to eliminate from said circuit means noise outputs of said first and second transducing means having no relationship with image sharpness, said correcting means being electrically coupled to said circuit means to supply an electrical signal thereto based on the brightness of the object, thereby the noise output of said first and second transducing means having no relationship with image sharpness is eliminated and detection of image sharpness may be performed while eliminating noise signals having no relationship with image sharpness.

4,031,384
CATOPTRIC SYSTEM FOR SIMULTANEOUS CONCENTRATION OF LIGHT, LASER, AND OTHER TYPE PARAXIAL RAYS INTO BEAMS

Benjamin F. Sherman, Jr., 6329 Mori St., McLean, Va. 22101

Division of Ser. No. 352,466, April 18, 1973, Pat. No. 3,892,476. This application Jan. 24, 1975, Ser. No. 543,925
Int. Cl.² G02B 5/10; G01J 1/20
U.S. Cl. 250—203 R **15 Claims**

1. A concentrator of a wide spectrum of reflectable emissions including limiting rays, such as of light rays, laser rays, infra-red rays, ultra-violet rays, sound waves, electrons and other types of radiant energy emissions from a remote source spaced rearwardly therefrom including a source moving relative thereto, such as planetary bodies, artificial wave sources, a light house, a ship, a signal-transmitting station and a communication sender, comprising:

at least portions of two symmetrically warped truncated shells:

an outer concave shell, provided with at least one inner reflecting surface and

an inner convex shell of a diameter, smaller than that of said outer shell provided at least at its vertex with at least one outer reflecting surface;

means to mount said shells on their central axis, the extremities of said shells being aligned on a conical surface and being defined by an imaginary cone whose surface is traversed by the limiting rays and whose vertex is at the common focal point of the said shells, and whose axis coincides with the central axis,

the reflecting surfaces of the shells being mounted spaced from each other and substantially facing each other at angles and at distances providing at least two successive reflections from each surface for said rays impinging upon them;

at least one of said surfaces including at least one paraboloidal reflector surface, and

means moving at least one of said warped surfaces in response to the changeable location of the said source relative to the said concentrator.

4,031,385
SOLAR TRACKING DEVICE

Gene A. Zerlaut, Phoenix, and Robert F. Heiskell, Glendale, both of Ariz., assignors to Desert Sunshine Exposure Tests, Inc., Phoenix, Ariz.

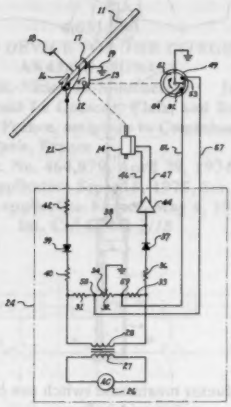
Filed Apr. 5, 1976, Ser. No. 673,484
Int. Cl.² G01J 1/20
U.S. Cl. 250—203 R **6 Claims**

2. Apparatus for controlling the orientation of a device to track the changing location of the sun in the sky, said apparatus comprising, in combination:

a. means for producing electrical signals corresponding to the position of the device relative to the brightest spot in the sky;

b. orientation means for positioning the device in response to the electrical signals to orient the device perpendicular to the brightest spot in the sky;

c. means for overriding said orientation means whenever the position of the brightest spot in the sky deviates more than a predetermined amount from the position of the sun in the sky;



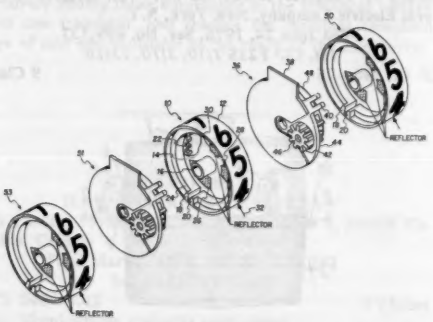
d. means for generating clock responsive signals representing the approximate position of the sun in the sky; and

e. means for locating the device in response to the clock responsive signals whenever said orientation means are overridden, thereby orienting the device approximately perpendicular to the position of the sun in the sky.

4,031,386
OPTICAL TRANSDUCER ENCODING APPARATUS

Gary B. Recker, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 15, 1976, Ser. No. 696,240
Int. Cl.² G01D 5/36; G06K 7/10
U.S. Cl. 250—230 **5 Claims**



1. Conversion apparatus for providing a visual and binary coded electrical output indication of the number of revolutions of a geared mechanical input wherein an indicating section includes:

a plurality of wheels each having a hub, a connecting web and a felly with indicia on an outer surface, a continuous set of gear teeth on an inner surface on one side of the web and a partial set of gear teeth on the inner surface on the other side of the web to drive further conversion sections, and

a plurality of stationary members, one for each wheel and mounted intermediate said wheels, cooperating with said

wheel to provide a bearing surface for a gear operable to mesh with the partial set of gear teeth of the present section and the continuous set of gear teeth of an adjacent further section, the improvement comprising:

a plurality of reflective surfaces situated on said web, each of said surfaces being located at the same radial distance, and

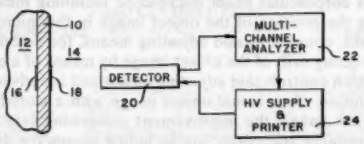
a plurality of optical transducers, including light sources, in said stationary member for detecting and outputting encoded binary digital signals indicate of individual ones of several possible rotational positions of said wheel relative to said stationary member.

4,031,387

METHOD OF DETERMINING WHETHER RADIOACTIVE CONTAMINANTS ARE INSIDE OR OUTSIDE A STRUCTURE

Kenneth R. Lattin, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 5, 1976, Ser. No. 711,926
Int. Cl.² G01D *18/00*; G01N *23/00*
U.S. Cl. 250—25[illegible] 4 Claims



1. A method of determining the amount of radioactive material inside a test structure compared to the amount outside the structure comprising the steps of:

a. disposing a first quantity of the radioactive material inside a dummy structure having the same shape and made of the same material as the test structure;

b. obtaining an inside spectrum of radiation from the first quantity of material inside the dummy structure by detecting radiation outside the dummy structure over a test range of energies that includes a Compton window where Compton scattering is caused by the material and that also includes a region of the spectrum where Compton scattering is negligible;

c. removing the first quantity;

d. disposing a second quantity of the radioactive material outside the dummy structure;

e. obtaining an outside spectrum of radiation from the second quantity by detecting radiation outside the dummy structure over the test range of energies;

f. obtaining a test spectrum from the test structure by detecting radiation outside the test structure over the test range of energies;

g. obtaining from the inside spectrum and outside spectrum ratios of counts of radioactive disintegrations per unit time in the Compton window to counts of radioactive disintegrations per unit time in the region where Compton scattering is negligible;

h. obtaining from the test spectrum a test ratio of counts of radioactive disintegrations per unit time in the Compton window to counts of radioactive disintegrations per unit time in the region where Compton scattering is negligible;

i. comparing the test ratio linearly with the ratio from the inside spectrum and the ratio from the outside spectrum to obtain a proportional measure,

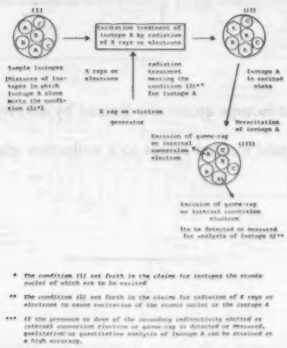
which proportional measure is a measure of the amount of the radioactive material inside the test structure compared to the amount outside.

4,031,388

METHOD FOR THE ANALYSIS OF ISOTOPES

Masato Morita; Reiko Morita, both of Suita, and Kiyoteru Otozai, Toyonaka, all of Japan, assignors to International Nuclear Fuel Co., Ltd., Toyonaka, Japan

Filed Sept. 6, 1974, Ser. No. 503,693
Claims priority, application Japan, Sept. 8, 1973, 48-101488
Int. Cl.² G01N *23/20*
U.S. Cl. 250—272 4 Claims


(1)
Excitation treatment of isotope A by radiation of X rays or electrons
(2)
Sample Isotopes
Mixtures of isotopes in which Isotope A alone meets the condition (1)*
X rays or electrons
radiation treatment meeting the condition (2)** for Isotope A
Isotope A in excited state
X ray or electron generator
Deexcitation of Isotope A
Emission of gamma-ray or internal conversion electron
(3)
Emission of gamma-ray or internal conversion electron
Ion to detected or measured for analysis of Isotope A)***

* The condition (1) set forth in the claim for isotopes the atomic nuclei of which are to be excited

** The condition (2) set forth in the claim for radiation of X rays or electrons to cause excitation of the atomic nuclei of the isotope A

*** If the presence or dose of the secondary radioactivity emitted as internal conversion electron or gamma-ray is detected or measured, qualitative or quantitative analysis of Isotope A can be attained at a high accuracy.

1. A method for the analysis of isotopes which comprises bombarding a substance with X-rays or electrons of a previously determined dose and energy for analyzing an isotope in the substance, to produce an excited state of the atomic nuclei of the isotope and thereafter detecting the gamma rays or internal conversion electrons emitted from the substance when the atomic nuclei is deactivated from the excited state to the ground state, wherein the bombardment of the substance with X-rays or electrons is carried out under such conditions that (1) in the atoms selected to be produced in the excited state of their nuclei, (a) the difference between the nuclear excitation energy and the difference between the binding energies of adequatly selected two electron orbits is small enough to introduce the nuclear excitation by electron transition, and (b) the system of the nucleus and the electrons in the case of ionizing an orbital electron in said atoms should satisfy the spin and parity conservation laws, and (12) the energy of the bombarding X-rays or electrons should be larger than the binding of one of the said two electron orbits which is located at a shorter distance from the atomic nucleus.

4,031,389

ISOTOPE SEPARATION USING METALLIC VAPOR LASERS

Gary R. Russell; Che Jen Chen, bbth of Sierra Madre, and Kenneth G. Harstad, Pasadena, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 26, 1974, Ser. No. 483,301
Int. Cl.² H01J *39/34*
U.S. Cl. 250—283 16 Claims

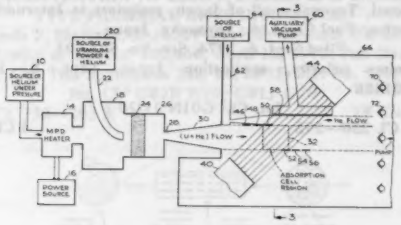
1. A method of separating a first isotope from a mixture of a first and second isotope comprising

heating a mixture of said first and second isotopes to a temperature at which they are vaporized and some free electrons are produced,

passing said vaporized isotopes with free electrons therein at a supersonic speed through an expansion nozzle to expand into a supersaturated vapor,

applying laser light having a predetermining frequency to

said supersaturated vapor to selectively elevate the energy level of said first isotope to an energy level at which



said first isotope atoms are ionized by said free electrons, and

directing said ionized atoms to a collection plate.

4,031,390
METHOD OF OPERATING A PARTICLE-BEAM APPARATUS

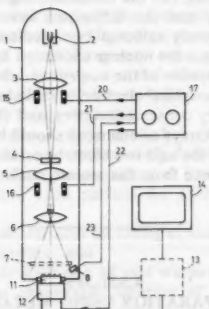
Karl-Heinz Müller; Volker Rindfleisch; Moriz V. Rauch, and Dieter Willasch, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 29, 1973, Ser. No. 392,526

Claims priority, application Germany, Sept. 7, 1972, 2344441

Int. Cl.² G01N *23/04*

U.S. Cl. 250—307 **4 Claims**



1. A method of operating a particle-beam apparatus such as an electron microscope equipped with a controlled deflection system arranged at the beam path, the method comprising adjusting the excitation of the deflection system to direct the particle-beam for a selectable time period onto a location of an object whereat the object is to be investigated; and, again adjusting the excitation of the deflection system to direct the particle-beam in the remaining time to another location of the object whereat the particle-beam passes through the object, the last-mentioned location being disposed laterally of the first mentioned location, said particle-beam apparatus being equipped with a second deflection system, the method comprising the ancillary step of adjusting the excitation of the second deflection system so as to cause the particle-beam to image the region of the object irradiated by the same.

4,031,391
ELECTRON MICROSCOPE INCLUDING IMPROVED MEANS FOR DETERMINING AND CORRECTING IMAGE DRIFT

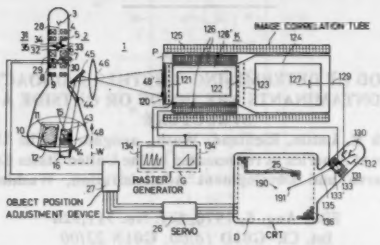
Walter Hoppe, Martinsried near Munich, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed June 21, 1976, Ser. No. 698,082

Claims priority, application Germany, July 1, 1975, 2529735

Int. Cl.² H01J *37/26*

U.S. Cl. 250—311 **15 Claims**



1. In a corpuscular beam microscope including means for adjusting the position of the object image in the microscope and means, coupled to said adjusting means, for determining and correcting drift of the object image by means of a control signal which controls said adjusting means and is derived from a convolution of an actual object image with a stored reference object image, the improvement comprising said means for determining and correcting including means for deriving said convolution by imaging said actual object image directly on said reference object image.

4,031,392
METHOD AND DEVICES FOR COUNTING EVENTS, PARTICULARLY RADIOACTIVE DISINTEGRATION EVENTS

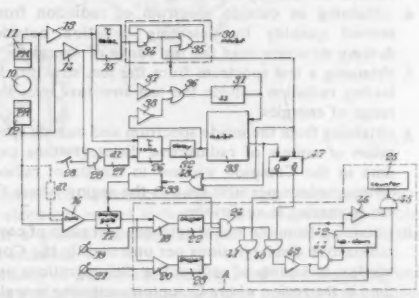
Pierre Giraud, Paris; Conrad Palais, Parly II Le Chesnay, both of France, and Edward Rapkin, Short Hills, N.J., assignors to Intertechnique S.A., Plaisir, France

Filed Mar. 31, 1976, Ser. No. 672,287

Claims priority, application France, Nov. 17, 1975, 75.35085

Int. Cl.² G01T *1/20*

U.S. Cl. 250—328 **8 Claims**



1. A device for counting specific events of a predetermined nature occuring in a sample in the presence of background noise due to events of another nature in said sample, comprising:

a first detector and a second detector operatively associated with a sample receiving location for the first detector and

the second detector to deliver respective signal pulses in time coincidence responsive to each said specific event, while one of said detectors at most delivers a signal pulse responsive to each said event of another nature,

first circuit means connected to receive said signal pulses from said first and second detectors and to deliver a first output signal responsive to each prompt coincidence between the signals received from the first and second detectors,

time delay circuit means connected to receive the signal pulses delivered by the first detector and in response thereto deliver a signal pulse delayed by a predetermined time duration *dt*,

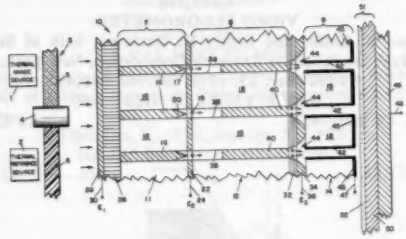
second circuit means connected to receive the signal pulses delivered by the second detector and by the time delay circuit and to deliver a second output signal responsiveto each time coincidence,

and counting means controlled by said first and second circuit means for counting in real time the excess of the coincidences detected by the first circuit means over the coincidences detected by the second circuit means.

4,031,393
THERMAL IMAGE CAMERA

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1976, Ser. No. 667,936
Int. Cl.² H01J *31/49*
U.S. Cl. 250—332 **10 Claims**



1. A thermal image camera comprising:

pyroelectric means for detecting a thermal image;

cathode means connected to the pyroelectric means for converting the thermal image to an electron image;

vacuum means communicating with the cathode means for guiding the passage of the electron image in a preselected location;

emitting means communicating with the vacuum means, in spaced relation with the cathode means, for storing and integrating the electron image;

means communicating with the emitting means for amplifying the density and kinetic energy of the electron image delivered from the emitting means; and

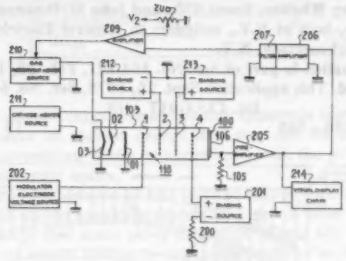
recording means positioned adjacent the outward end of the amplifying means for receiving an amplified electron image thereagainst.

4,031,394
CAMERA DEVICE WITH RESISTIVE TARGET

Pierre Felix; Philippe Gamot; Guy Moiroud, and Serge Veron, all of Paris, France, assignors to Thomson-CSF, Paris Cedex, France

Filed June 21, 1976, Ser. No. 697,750
Claims priority, application France, June 27, 1975, 75.20397
Int. Cl.² H01J *31/49*
U.S. Cl. 250—333 **8 Claims**

1. A camera device with a resistive target comprising a camera tube having a target which in operation receives the energy emanating from the subject on one of its surfaces and which has the property of showing at each point between its two surfaces a dielectric polarisation governed by the energy absorbed by that point, means for generating inside said tube a beam of electrons issuing from a cathode and scanning point by point the other surface of said target so as to bring these points to the potential of said cathode and associated means for reading the signal current of flow of electrons desposited at each point of the target by said beam to obtain this potential, said tube comprising in its interior a first grid arranged in the vicinity of said cathode controlling the intensity of said beam,

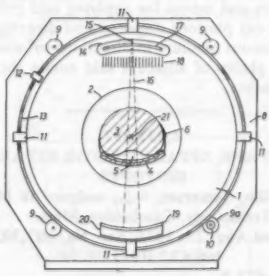


a heated ionisable gas reservoir made of a material of which the absorption capacity for said gas and hence the pressure of said gas in the tube is governed by its temperature, ions being generated in said tube by collision between the electrons of said beam and the molecules of said gas, and another grid arranged in the vicinity of said target and brought to a positive d.c. potential which is fixed in relation thereto, said camera device being characterised in that it comprises means for controlling the generation of said ions in the tube in dependence upon the average value of the target currents over a given period.

4,031,395
RADIOGRAPHY

Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Middlesex, England

Filed Mar. 19, 1976, Ser. No. 668,518
Claims priority, application United Kingdom, Mar. 20, 1975, 7366/75; June 21, 1975, 26485/75; Mar. 20, 1975, 11553/75
Int. Cl.² A61B *6/02*; G01N *23/08*; H05G *1/30*
U.S. Cl. 250—360 **10 Claims**



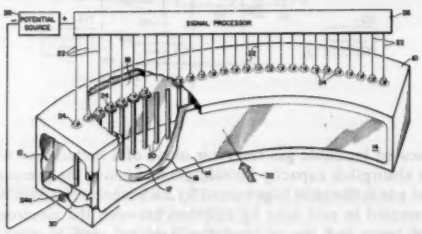
1. An apparatus for examining a body by means of penetrating radiation including a source means arranged to irradiate the body with a planar spread of said radiation, detector means arranged to detect the radiation to provide output signals, relating to absorption of the radiation by the body, for processing to provide a representation of the distribution of absorption in a substantially planar section of the body and

means adapted to scan the planar spread of radiation in relation to the body so as to irradiate said section along a plurality of beam paths passing through the body from a plurality of direction, wherein said detector means comprises a plurality of detector devices of which a predetermined number are irradiated by said spread at any time and wherein the scanning means is arranged to traverse the spread of X-rays along the detector devices so as to change the irradiated devices progressively.

4,031,396
X-RAY DETECTOR

Nathan Rey Whetten, Burnt Hills, and John M. Houston, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 554,171, Feb. 28, 1975, abandoned. This application Sept. 26, 1975, Ser. No. 616,930
Int. Cl.² G01T *1/18*
U.S. Cl. 250—385 **19 Claims**



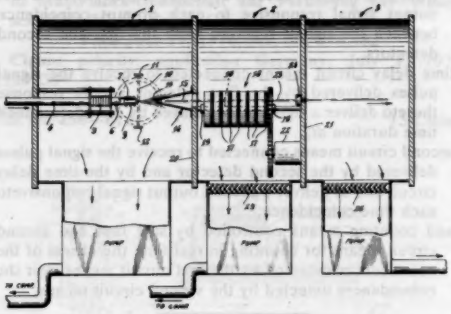
1. An x-ray detector comprising:
a gaseous medium of the type characterized as being substantially opaque to electromagnetic radiation at x-ray frequencies;
a plurality of substantially planar sheet anodes, comprising material which is characterized as being substantially opaque to electromagnetic radiation at x-ray frequencies, disposed in said gaseous medium;
a plurality of substantially planar sheet cathodes, comprising material which is characterized as being substantially opaque to electromagnetic radiation at x-ray frequencies, disposed in said gaseous medium, each of said cathodes lying approximately equi-distant between two of said anodes;
means for applying direct current electric potential between said cathodes and said anodes;
means for separately measuring the electric current flow from each of said anodes connected in series between said anodes and means for applying said potential; and
a beam of x-ray photons disposed and directed to impinge on said gaseous medium in directions substantially parallel to the planes of adjacent said anode sheets and said cathode sheets.

4,031,397
METHOD AND APPARATUS FOR SEPARATING ISOTOPES

Mark J. Cardillo, Somerset, N.J., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 25, 1975, Ser. No. 607,393
Int. Cl.² H01J *39/34*
U.S. Cl. 250—423 P **8 Claims**

1. A process for separating isotopes from a gaseous mixture thereof which comprises expanding said mixture to form a molecular beam of the mixture in a carrier gas, the molecules of the carrier gas having a mass either less than or greater than the mass of all the molecules containing the isotopes, exposing the gaseous mixture to a laser light having a radiation frequency that causes excitation of the rotational energy of the isotope molecules having the lowest mass without exciting the rotational energy of the other isotope molecules in said mixture, passing said molecular beam through a means for separating the mixture of isotopes on the basis of differences in velocity profiles of each of the isotopes, controlling the time period between the initial expansion of the gas and subsequent

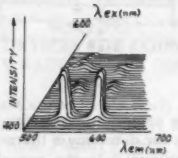


separation of the molecular beam to permit conversion of at least a portion of laser-induced rotational energy to translational energy by secondary collision of the excited isotope molecules with molecules of said carrier gas but without substantially complete conversion of said induced rotational energy to translational energy.

4,031,398
VIDEO FLUOROMETER

James B. Callis, and Ernest R. Davidson, both of Seattle, Wash., assignors to Research Corporation, New York, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,493
Int. Cl.² F21K *2/02*; G01T *1/00*
U.S. Cl. 250—458 **19 Claims**



1. Apparatus for fluorescence spectroscopy comprising:
a. means for holding a sample of fluorescent material;
b. means for simultaneously directing a spatially distributed spectrum of exciting energies onto said sample distributed along its length; and
c. means for simultaneously analyzing the set of fluorescence emissions given off by said sample along its length by producing a fluorescence intensity matrix of the excitation and emission spectra.

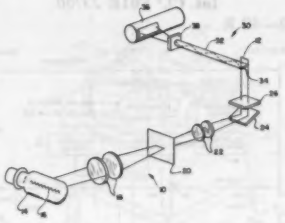
4,031,399
FLUOROMETER

Gerald Lee Klein, Orange, and Richard C. Meyer, La Habra, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 24, 1975, Ser. No. 552,653
Int. Cl.² G01M *21/38*
U.S. Cl. 250—461 B **4 Claims**

1. A fluorometer comprising:
means for generating a small area of light of a first bandwidth in a plane of a sample to be analyzed, said sample emitting radiation of a second bandwidth in response to said light striking said sample;

transfer means on a side of said plane receiving said light and immediately adjacent said sample for collecting radiation emitted from said sample and for transmitting said radiation to the exclusion of said light to a detector remote from said sample for analysis, said transfer means comprising an opaque light shield including a port immediately adjacent said sample and including a longitudinal axis defining an acute angle with said plane and being



dimensioned to receive and collect a sector of the radiation emitted from said sample, and a light pipe mounted in said shield with an acutely angled end in said port to intersect said longitudinal axis and an opposite end remote from said sample and facing said detector; and

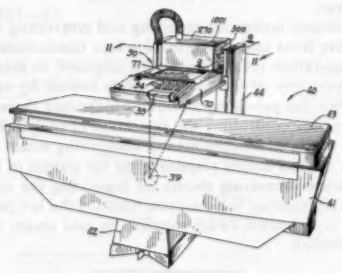
a radiation filter for only passing radiation of said second bandwidth, said filter being located at said opposite end of said light pipe and adjacent said detector.

4,031,400

X-RAY SOFT FILMER

Robert P. Hunt, Chesterland, and Robert J. Steffek, Wickliffe, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed Oct. 7, 1974, Ser. No. 512,998
Int. Cl.² B65H 5/22; G11B 1/00
U.S. Cl. 250—468 **43 Claims**



17. An X-ray spot filmer, comprising:

a. a housing structure defining a chamber and having an opening formed therethrough communicating with said chamber;

b. a film positioning assembly movably supported within said chamber for movement between a loading position and an exposure station;

c. drive means carried within said chamber for moving said film positioning assembly between said loading position and said exposure station;

d. film feed means for feeding a sheet of film along a feed path into said assembly and for feeding a sheet of film out of said assembly when said assembly is in said loading position; and,

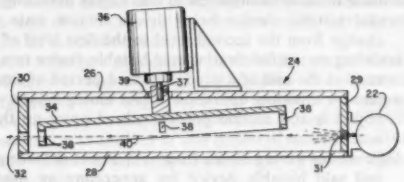
e. support means supporting said film feed means for movement as a unit through said opening for insertion into and withdrawal from said housing structure.

4,031,401

RADIANT ENERGY IMAGING SCANNING

Daniel Jacob, Allston, Mass., assignor to American Science & Engineering, Inc., Cambridge, Mass.

Filed Mar. 14, 1975, Ser. No. 558,426
Int. Cl.² G01J 1/00
U.S. Cl. 250—503 **5 Claims**



1. Radiant energy image scanning apparatus comprising,

a source of radiant energy that may not be focused by conventional lenses in accordance with the principles of geometric optics,

first means opaque to said radiant energy formed with an exit slit for providing therefrom a pencil beam of radiant energy that scans along the length of said slit.

second means opaque to said radiant energy in the form of an annular rim formed with at least one slit that is generally parallel to the rim axis and generally perpendicular to the length of said exit slit.

and means for rotatably supporting said second means for rotation about said axis with the projection of the at least one slit therein traversing said exit slit as said annular rim rotates oriented so that one surface of said annular rim intercepts said radiant energy while the portion of the annular rim diametrically opposite the intercepting portion is offset from a line joining said source and said exit slit whereby said slit in said second means transmits said radiant energy to said exit slit as said second means is angularly displaced about its axis to coact with said exit slit to provide said scanning pencil beam,

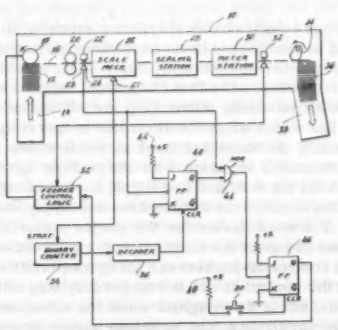
said source of radiant energy being outside said annular rim and spaced from said exit slit by a distance greater than the diameter of said annular rim.

4,031,402

STREAM FEED DETECTOR FOR DETECTING DOCUMENT SPACING

Daniel F. Dlugos, Huntington, and Flavio M. Manduley, Seymour, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 23, 1976, Ser. No. 669,530
Int. Cl.² G06K 7/015, 15/00
U.S. Cl. 250—557 **8 Claims**



1. For use in a object handling device wherein objects are

fed in seriatim along a predetermined path, a stream feed detector for detecting inadequate separation of successive objects, said stream feed detector including:

an object detecting means located on the path at a predetermined point for generating a first level of signal when an object is present and a second level of signal when no object is present;

a bistable device connected to said object detecting means, said bistable device being driven to one state upon a change from the second level to the first level of signal;

counting means for clearing said bistable device to a second state at the end of a predetermined period of time;

means for initiating operation of said timing means when an object is at a second predetermined point on the path; and

logic means having inputs from said object detecting means and said bistable device for generating an inadequate separation signal if the output of said object detecting means returns to the first level before said bistable device is cleared to the second state.

4,031,403

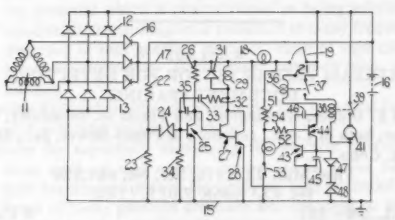
ROAD VEHICLE ELECTRICAL SYSTEMS

William Frank Hill, Stafford, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Continuation of Ser. No. 385,561, Aug. 3, 1973. This application Sept. 22, 1975, Ser. No. 615,806

Int. Cl.² F02N *11/00*

U.S. Cl. 290—38 R **8 Claims**



1. A road vehicle electrical system comprising an alternator, first and second supply lines, a rectifier connecting the alternator to the first and second supply lines, a vehicle battery connected between the first and second supply lines, at least one additional diode connecting the alternator to a third supply line which when the alternator is operating will reach substantially the same potential as the first line, a warning lamp connected in series with the vehicle ignition switch between the the third and first supply lines, a voltage regulator connected between the third and second supply lines, a starter motor, a control device for the starter motor which when energised energises the starter motor, circuit means connecting said control device between the first and third supply lines so that the control device is energised by way of the voltage regulator, but is de-energised when the alternator energises the third supply line, and switching means operated by the engine of the vehicle independently of the alternator for preventing the control device from being re-energised while the engine is running.

4,031,404

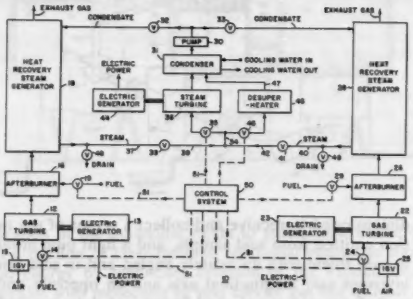
COMBINED CYCLE ELECTRIC POWER PLANT AND A HEAT RECOVERY STEAM GENERATOR HAVING IMPROVED TEMPERATURE CONTROL OF THE STEAM GENERATED

Lyle F. Martz, Verona, Pa., and Richard J. Plotnick, Cherry Hill, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,723

Int. Cl.² F01K *23/00*

U.S. Cl. 290—40 R **32 Claims**



1. A combined cycle electric power plant comprising:

a. at least one gas turbine including an exit through which heated exhaust gases pass;

b. means for generating steam coupled to said gas turbine exit for transferring heat from the exhaust gases to a fluid passing through said steam generating means;

c. a steam turbine coupled to said steam generating means and driven by the steam supplied thereby;

d. means for generating electric power by the driving power of said turbines;

e. an afterburner for supplying additional heat to the exhaust gases passing from said gas turbine to said steam generating means;

f. valve means for controlling the flow of fuel to said afterburner;

g. condenser means for receiving and converting the spent system from said steam turbine into condensate;

h. temperature measuring means disposed to measure the temperature of the exhaust gases heated by said afterburner, for providing an output indicative thereof; and

i. means for controlling the operation of said turbines and said steam generating means, comprising steam temperature control means responsive to the output of said temperature measuring means for regulating the opening of said afterburner valve means, whereby the temperature of the superheated steam supplied to said steam turbine is controlled.

4,031,405

WINDMILL WITH SHROUD ADJUSTING MEANS

Paul Asperger, 4225 Cheryl Drive, Flint, Mich. 48506

Filed Aug. 4, 1975, Ser. No. 601,464

Int. Cl.² F03D *9/02*

U.S. Cl. 290—55 **6 Claims**

1. A windmill comprising:

a vane assembly and means rotatably mounting said vane assembly about a vertical axis;

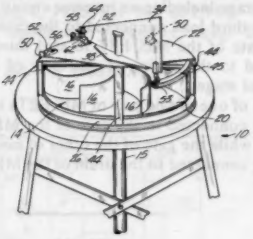
a shroud disposed over a portion of said vane assembly and means mounting said shroud to be rotatable with respect to said vane assembly whereby said shroud can be rotated to cover different portions of said vane assembly;

a directional vane movable by the wind to face the direction of the wind and means rotatably mounting said directional vane independently of said assembly;

means selectively attaching said directional vane to said shroud at different positions on said shroud whereby said

shroud is moved by said directional vane to a position with respect to said vane assembly depending upon the position at which said directional vane is attached to said shroud;

said vane assembly mounting means comprising a first shaft and said directional vane mounting means comprising a second shaft, said first shaft and said second shaft being independent of each other, said first shaft being mounted



in a fixed position and said second shaft being fixed to said vane to be rotatable therewith;

said shroud mounting means including means rotatably mounting said shroud to said first shaft;

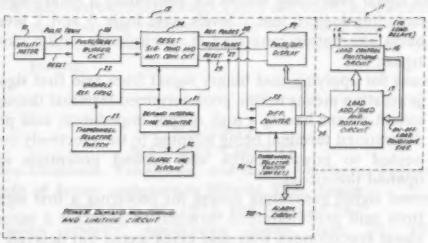
said attaching means comprising a plurality of stop members disposed on said shroud and spaced within an arc of substantially 90° with respect to the axis of rotation of said shroud and means carried by said directional vane for selective attachment to said stop means.

4,031,406

METHOD AND APPARATUS FOR CONTROLLING ELECTRICAL LOADS

Warren L. Leyde, Seattle, and Delbert E. Marker, Issaquah, both of Wash., assignors to Pacific Technology, Inc., Renton, Wash.

Filed June 16, 1975, Ser. No. 587,150
Int. Cl.² H02J *13/00*
U.S. Cl. 307—41 **13 Claims**



1. In an electrical system including a load controller having a plurality of load controlling outputs each capable of assuming either a load-on condition or a load-off condition, said outputs being adapted for individually controlling the connections of a corresponding plurality of electrical loads to a power source, and a load regulating means connected to said controller for regulating the collective status of said load-on and load-off conditions at said outputs, said regulating means assuming an add mode when the number of said outputs that are in said load-on condition is to be increased and assuming a shed mode when the number of said outputs that are in said load-on condition is to be decreased, the improvement in said controller comprising:

switching means connected to said outputs and having input means responsive to said regulating means for successively switching said outputs from said load-off conditions to said load-on conditions when the regulating means is in the add mode and for successively switching said outputs from said load-on conditions to said load-off conditions when said regulating means is in the shed mode, said switching means including means for establishing a plurality of different orders of succession in which said outputs are successively switched;

rotation circuit means for changing said switching means from one of said orders of succession to another of said orders of succession; and,

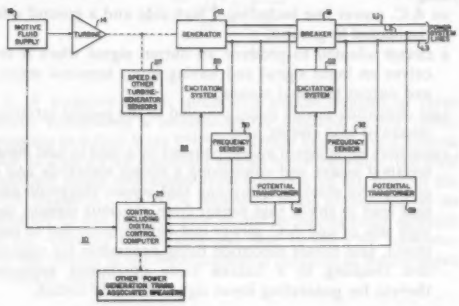
means for sensing a predetermined collective status of said conditions at said outputs, said rotation circuit means being operative in response to said means for sensing so as to change said switching means from one of said orders of succession to another of said orders of succession when said conditions at said outputs assume said predetermined collective status.

4,031,407

SYSTEM AND METHOD EMPLOYING A DIGITAL COMPUTER WITH IMPROVED PROGRAMMED OPERATION FOR AUTOMATICALLY SYNCHRONIZING A GAS TURBINE OR OTHER ELECTRIC POWER PLANT GENERATOR WITH A POWER SYSTEM

Terry J. Reed, Latrobe, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 99,493, Dec. 18, 1970, abandoned.
This application July 31, 1972, Ser. No. 276,343
Int. Cl.² H01J *3/00*
U.S. Cl. 307—87 **32 Claims**



1. A system for operating an electric power plant comprising an electric generator, a prime mover for driving said generator, a circuit breaker for connecting the electric output of said generator to an external power system, a plant control system including means for controlling prime mover motive fluid flow, said control system including a digital control computer, means for detecting the generator speed and the external system frequency, means for determining a computer representation of the magnitude and rate of change of generator output and external system phase difference as a function of time, means for generating a first electric signal representative of the phase difference between the generator and system waveforms, the last named determining means finely determining said phase difference representation in accordance with a computer representation of said phase difference signal after the slip frequency is reduced below a predetermined value, the last named determining means roughly determining said phase difference representation in accordance with representations of the generator speed and external system frequency until the slip frequency is reduced below said predetermined value, said control system providing a loop for controlling prime mover speed in response to a speed reference means for operating said computer within said speed control loop at least to generate said speed reference representation at least during startup operations, means for operating said computer to modify said speed reference representation as a func-

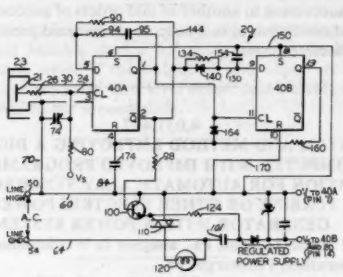
tion of said phase difference representation, means for operating said computer to generate a breaker closure command when said phase difference representation reaches a predetermined condition, and means for operating said breaker in response to said closure command.

4,031,408

PROXIMITY SWITCHING SYSTEM

George Ernest Holz, 97 Grandview Ave., N. Plainfield, N.J. 07060

Filed Oct. 3, 1975, Ser. No. 619,306
Int. Cl.² H05B 37/00
U.S. Cl. 307—116 16 Claims



1. A control system for operating a utilization device comprising

an A.C. power line including a high side and a ground side connected to ground,

a circuit adapted to produce an output signal when it receives an input signal and having input terminal means and output terminal means,

said utilization device being coupled to the output terminal means of said circuit, and

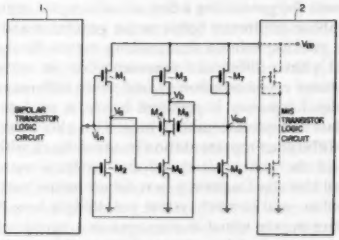
capacitive input signal means coupled by a lead to said input terminal means and comprising a sensor electrode and a conductive shield surrounding said sensor electrode and said lead to shield said sensor from spurious signals, the high side of said A.C. power line being connected to said shield, said sensor electrode being accessible for capacitive coupling to a human body positioned adjacent thereto for generating input signals for said circuit.

4,031,409

SIGNAL CONVERTER CIRCUIT

Shunji Shimada, Kodaira, and Harumi Wakimoto, Hino, both of Japan, assignors to Hitachi, Ltd., Japan

Filed May 26, 1976, Ser. No. 689,966
Claims priority, application Japan, May 28, 1975, 50-62897
Int. Cl.² H03K 3/353, 19/08
U.S. Cl. 307—208 3 Claims



1. A signal converter circuit comprising:

a first stage including a source follower circuit having a MIS FET and a first load connected to the source of the MIS FET, the gate of said MIS FET being arranged for reception of an input to the signal converter cicuit;

a second stage including a pair of MIS FETs having their drains connected to each other and their sources connected to each other, a switching MIS FET having its drain connected to the sources of said pair of MIS FETs and its gate connected to the output of said source follower circuit, and a second load connected to the drains of said pair of MIS FETs; and

a third stage including an inverter circuit having a MIS FET and a third load connected to the drain of the MIS FET, the gate of the MIS FET in said third stage being connected to the drains of said pair of MIS FETs in said second stage;

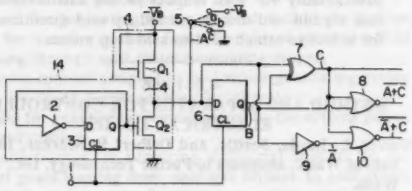
the gate of one of said pair of MIS FETs in said second stage being connected to the gate of the MIS FET in said first stage while the gate of the other of said pair of MIS FETs being connected to the drain of the MIS FET in said third stage.

4,031,410

THREE-STATE DISCERNMENT CIRCUIT

Tadao Kikuchi, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed June 22, 1976, Ser. No. 698,788
Claims priority, application Japan, June 23, 1975, 50-75566
Int. Cl.² H03K 19/08, 17/02
U.S. Cl. 307—209 2 Claims



1. A three-state discernment circuit comprising:

first signal generating means for generating a binary signal including logic 0 and 1 levels, said logic 0 and 1 levels being alternately generated in synchronism with a clock signal;

means for applying said binary signal from said first signal generating means to one predetermined terminal through circuit means having a high output impedance, said predetermined terminal being adapted to be selectively connected to power source and ground potentials and opened therefrom;

second signal generating means for receiving a first signal from said predetermined terminal to generate a second signal synchronous with said clock signal but delayed by one bit relative to said first signal;

first logic means for receiving said first and second signals to produce a first logic output representative of an EXCLUSIVE OR combination thereof;

second logic means for receiving said first logic output and one of said first and second signals to produce a second logic output representative of a NOR combination thereof; and

third logic means for receiving said first logic output and an inversion of one of said first and second signals to produce a third logic output representative of a NOR combination thereof;

whereby a desired signal is obtained from one of said first, second and third logic means in accordance with one of the condition that said predetermined terminal is connected to the power source potential, the condition that the predetermined terminal is connected to the ground potential and the condition that the predetermined termi-

nal is opened from the power source and ground potentials.

4,031,411

MONOLITHIC INTEGRATED CIRCUIT FOR THE DISTORTION OF A SAW-TOOTH SIGNAL

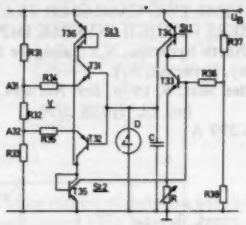
Hermannus Schat, Freiburg, and Laurin Clemens Freyberger, Endingen, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,759

Claims priority, application Germany, Aug. 16, 1974, 2439343

Int. Cl.² H03K 17/00

U.S. Cl. 307—228 6 Claims



1. A monolithic integrated circuit for distorting a linear saw-tooth signal without using RC-networks, preferably for the tangent correction of the saw-tooth shaped vertical deflecting current of television picture tubes, which saw-tooth is generated by the charging of a capacitor, comprising:

a regulating circuit which influences the charging current of said capacitor in dependence upon the amplitude of the saw-tooth generator output signal, said regulating circuit comprising:

a voltage comparator (V) having applied thereto the capacitor voltage;

a coupling transistor (T33) having a base electrode coupled to the output of said voltage comparator; an emitter electrode coupled to a reference and

a first current transformer (St1), the collector current of said coupling transistor being coupled to the charging current of said capacitor via said first current transformer.

4,031,412

MEMORY CIRCUIT

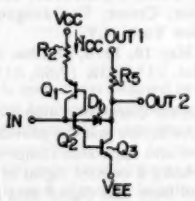
Ichiro Ohhinata, Yokohama, and Shinzi Okuhara, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 23, 1975, Ser. No. 643,757

Claims priority, application Japan, Dec. 27, 1974, 50-148637

Int. Cl.² H03K 17/00; G11C 11/40

U.S. Cl. 307—238 10 Claims



1. A memory circuit comprising:

a semiconductor element circuit having equivalently a PNPN four-layer structure including a P-type emitter, an N-type base, a P-type base and an N-type emitter; and at least an NPN transistor and a diode; and wherein

said N-type emitter of said semiconductor element circuit is connected to the base of said NPN transistor, said P-type base of said semiconductor element circuit is connected to the anode of said diode, the cathode of said diode being connected to the collector of said NPN transistor, said collector being used for a current absorbing terminal, whereby the NPN transistor is adapted to be set to a controlled saturation state by feeding current externally to the collector of said NPN transistor to thereby maintain the memory circuit in the ON state.

4,031,413

MEMORY CIRCUIT

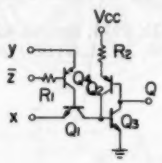
Ichiro Ohhinata, Yokohama; Shinzi Okuhara, Fujisawa, and Tetsuo Takeshita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 2, 1976, Ser. No. 646,045

Claims priority, application Japan, Jan. 10, 1975, 50-4938; May 14, 1975, 50-56072

Int. Cl.² G11C 15/04, 11/40

U.S. Cl. 307—238 6 Claims



1. A memory circuit under the logical control of three inputs, comprising a semiconductor element circuit corresponding to a four layer PNPN structure and having a control gate; at least a PNP transistor and an NPN transistor, the PNP transistor being connected at its collector to the base of the NPN transistor, the NPN transistor being connected at its collector to the control gate of the semiconductor element circuit, whereby the emitter and base of the PNP transistor and the emitter of the NPN transistor function as logical input terminals, respectively.

4,031,414

CIRCUIT ARRANGEMENT FOR PRODUCING HIGH CURRENT PULSES

Thomas Clyde Giles, Downers Grove; Otto James Kohout, Addison, and Gerald Michael Rinaldi, Mundelein, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 10, 1976, Ser. No. 694,751

Int. Cl.² H03K 17/00

U.S. Cl. 307—270 8 Claims

1. A pulse generating circuit for supplying high current pulses to a load comprising:

a first selectively controlled constant current source;

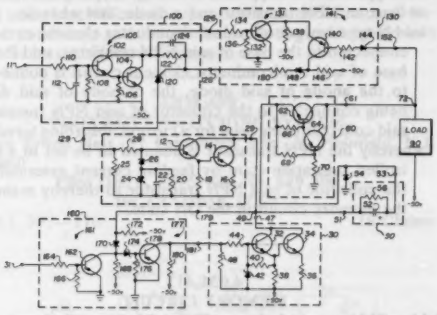
capacitor means connected to said first constant current source;

a second selectively controlled constant current source connected to said capacitor means for charging said capacitor means to a first predetermined voltage level;

first means for establishing a first electrical path for charging said capacitor means when said second constant current source is operated;

second means for limiting the voltage at the output of said first constant current source to a first predetermined value when said first constant current source is operated; and

third means for isolating said load from said capacitor

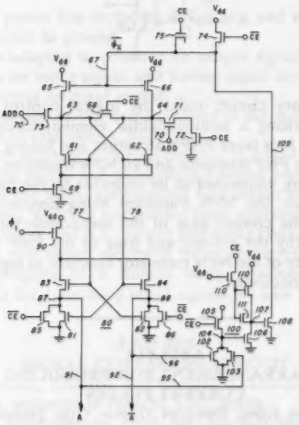


means when said second constant current source is operated.

4,031,415
ADDRESS BUFFER CIRCUIT FOR SEMICONDUCTOR MEMORY

Donald J. Redwine, and Norishisa Kitagawa, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 22, 1975, Ser. No. 624,813
Int. Cl.² H03K *3/286, 3/353;* G11C *11/40;* H03K *5/20*
U.S. Cl. 307—279 **21 Claims**



1. An input buffer circuit for an address input of a semiconductor memory device, comprising:

a pair of driver transistors substantially unbalanced in size and characteristic, each driver transistor having a control electrode and two output electrodes, the driver transistors being cross coupled by connection of the control electrode of each to an output electrode of the other,

a pair of load transistors, one for each of the driver transistors, the load transistors being substantially balanced in size and characteristic, each of the load transistors being connected in series with one of the driver transistors and a supply voltage,

means connected to turn on the pair of load transistors at a given time and to turn off the load transistors after a preselected period;

means to short output electrodes of the pair of cross coupled driver transistors together to equalize the voltages on such output electrodes prior to said given time;

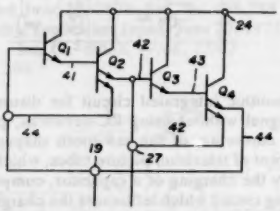
means connected to one of the output electrodes of one of said pair of cross-coupled driver transistors to couple said one of the output electrodes to a reference potential when said address input is present during said preselected period; and

a pair of address signal output circuits, each of which has an input connected to an output electrode of a different one of the pair of cross-coupled driver transistors and responsive to the voltage level thereof during said preselected period but delayed by a specified period after said given time, one of the pair of address signal output circuits producing an address signal and the other producing the complement of the address signal during a period of time beginning after said specified period.

4,031,416
SEMICONDUCTOR AMPLIFICATION MEANS COMBINING TWO CASCADED TRANSISTOR AMPLIFIERS OF HIGH INVERSE IMPEDANCES

William Peil, North Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,509
Int. Cl.² H03K *3/26*
U.S. Cl. 307—299 A **6 Claims**



1. Semiconductor amplification means comprising:

a. four transistors of like conductivity type wherein

1. the emitter of the first transistor (Q1) is coupled to the base of the second transistor (Q2),

2. the transistor Q2 has a first and a second emitter, said first emitter of Q2 being coupled to the base of the third transistor (Q3), and the second emitter of Q2 being coupled to the base of Q1 to insure turn off of Q2 when Q1 is turned off,

3. the emitter of Q3 is coupled to the base of the fourth transistor (Q4),

4. the transistor Q4 has a first and a second emitter, said first emitter of Q4 being coupled to the base of Q1, and said second emitter of Q3 being coupled to the base of Q3 to insure turn off of Q4 when Q3 is turned off, and

b. a first terminal for connection to a d.c. source coupled to the collectors of Q1, Q2, Q3, Q4.

4,031,417
APPARATUS FOR COUPLING A DIGITAL DATA GENERATOR TO A DIGITAL DATA READOUT DEVICE WITH ELECTRICAL ISOLATION THEREBETWEEN

Charles R. Wesner, Crozet, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,991
Int. Cl.² H03K *17/60, 03/42*
U.S. Cl. 307—311 **6 Claims**

1. An apparatus for coupling a digital data generator to a digital data readout device and for providing electrical isolation therebetween, said apparatus comprising:

means for providing a control signal in response to a data signal coupled from said digital data generator;

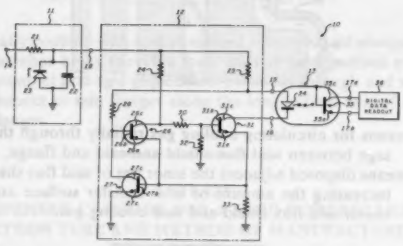
means coupled to said control means for switching from a first state to a second state when said control signal achieves a first predetermined level and from said second state to said first state when said control signal achieves a

second predetermined level, said switching means including

a first transistor having its collector coupled to said control means and its base coupled to said control means;

a second transistor having its collector coupled to said base of said first transistor, its base coupled to the emitter of said first transistor and the emitter coupled to ground; and

a third transistor having its base coupled to ground and to said collector of said first transistor and its emitter coupled to ground and to said base of said transistor; and



means for providing electrical isolation between said switch means and said digital data readout device and for coupling a signal, in response to said state of said switch means, to said digital data readout device, said coupled signal being representative of said data signal generated by said digital data generator, said isolation means having a first input terminal coupled to the base of said first transistor of said switch means and a second input terminal coupled to the collector of said third transistor of said switch means and having first and second output terminals coupled to said digital data readout device.

4,031,418
LOW FREQUENCY ACOUSTICAL PIEZO-ELECTRIC TRANSDUCER

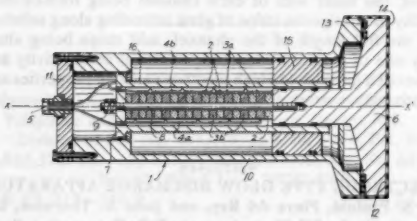
Philippe Cluzel; Michel Quivy, both of Six-les-Fours-les Plages, and Bernard Tocquet, Sanary, Mer, all of France, assignors to Etat Francais, Paris, France

Filed Sept. 3, 1975, Ser. No. 610,076

Claims priority, application France, Sept. 9, 1974, 74.30415

Int. Cl.² H01L *41/04*

U.S. Cl. 310—8.2 **8 Claims**



1. In a piezo-electric transducer adapted to capture or emit acoustical waves of low frequency including a stack of piezo-electric elements and alternating electrodes, a front receiver plate and a rear countermass, the stack being placed between the front plate and the rear countermass, an improvement wherein said counter mass is placed at least in part at the front of the rear extremity of the stack and therearound, and comprises a rigid annular block mounted around the stack, a rear plate at the rear extremity of the stack, and elastic connection means between said block and said rear plate, said elastic connection means including a tube, the stack being in the interior of said tube.

4,031,419
SELF-STARTING SYNCHRONOUS AND STEPPING MOTOR HAVING A PERMANENT MAGNET ROTOR

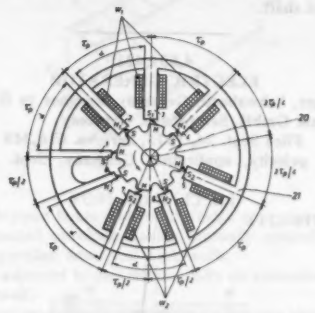
August Spiesberger, Lahr, and Claus Schäffer, Heiligenzell, both of Germany, assignors to Gerhard Berger, Fabrik Elektrischer Messgerate, Lahr, Germany

Filed July 28, 1975, Ser. No. 599,765

Claims priority, application Germany, July 31, 1974, 2436886

Int. Cl.² H02K *37/00*

U.S. Cl. 310—49 R **10 Claims**



1. In a self-starting synchronous motor of the type having $m \geq$ two phases, a permanent magnet-type rotor with a plurality of alternately polarized poles, a stator including individually excited and inwardly facing main stator poles, both said stator and rotor having an interpole center-to-center angular distance of τ_p, said stator poles being combined in u groups of alternate polarity per phase which groups are spatially displaced from each other by an angle $\tau_p/m = \delta = 180°/m \cdot p$, where p is the number of pole pairs of the rotor, the improvement comprising that at least one windingless auxiliary stator pole of approximately one-half of the width of the main stator poles is provided per group and per phase in addition to the main stator poles, the total number of stator poles being at least equal to the number of rotor poles.

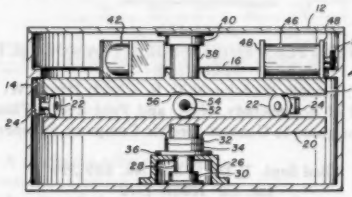
4,031,420
FLYWHEEL DRIVE SYSTEM

Eugene P. Carini, 800 28th Ave., Vero Beach, Fla. 32960

Filed Apr. 22, 1976, Ser. No. 679,193

Int. Cl.² H02K *7/02*

U.S. Cl. 310—74 **12 Claims**



1. Rotary motion producing apparatus comprising:

a housing;

first flywheel means, said first flywheel means including a

first flywheel supported in said housing for rotation about an axis;

second flywheel means, said second flywheel means including a second flywheel supported in said housing for rotation about said axis;

drive means for causing said first flywheel to rotate about said axis, said drive means including at least a first electric motor;

means drivingly coupling said first flywheel to said second flywheel whereby said first and second flywheels rotate about said axis in opposite directions;

power take-off means, said power take-off means including a rotatable output shaft oriented transversely to said axis; and

means coupling said first and second flywheel means to said power take-off means whereby the motion of said flywheels is transmitted to said power take-off means output shaft.

4,031,421

ELECTRIC GENERATOR

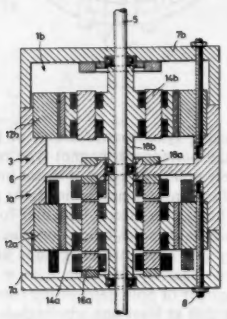
Otto Geiger, Schwabach, Germany, assignor to GeSig Energietechnik GmbH, Schwabach, Germany

Filed Sept. 24, 1975, Ser. No. 616,349

Claims priority, application Germany, Sept. 25, 1974, 2445765

Int. Cl.² H02K *19/34*

U.S. Cl. 310—112 **12 Claims**



1. An electric generator comprising, in combination, a rotor with a shaft, a stator, both carrying respective, peripherally successive poles with a substantially uniform angular distance therebetween, and at least one pair of electrically identical but separate axially aligned generator sections, the latter including pole cores that occupy substantially the same sectors as gaps therebetween, and wheren the angular position of said shaft, in which position said rotor poles overlap between the rotor and the stator of the same generator section, is offset from both generator sections by half the angular distance between said rotor poles.

4,031,422

GAS COOLED FLUX SHIELD FOR DYNAMOELECTRIC MACHINE

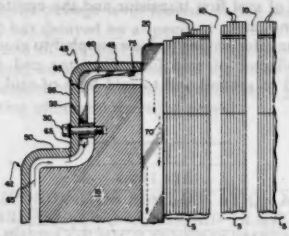
Anthony F. Armor; Madabushi V. K. Chari; Henry W. Kudiacik, all of Schenectady, N.Y., and Paul Reece, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,390

Int. Cl.² H02K *1/12*

U.S. Cl. 310—256 **6 Claims**

1. A dynamoelectric machine of the type including a gas cooled stator core comprising a plurality of laminations held in assembled relationship by end flanges applying a compressive loading thereto and an annular flux shield for reducing the eddy current losses in the end flanges and the stator cores, the flux shield including an inner rim disposed adjacent to and spaced from a respective end flange for providing a passage for the flow of cooling gas therebetween and including the improvement comprising:



means for circulating cooling gas radially through the passage between said flux shield and said end flange, and

means disposed adjacent the inner rim of said flux shield for increasing the amount of heat transfer surface area between said flux shield and said cooling gas.

4,031,423

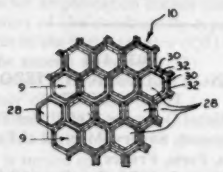
CHANNEL STRUCTURE FOR MULTI-CHANNEL ELECTRON MULTIPLIERS AND METHOD OF MAKING SAME

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 30, 1969, Ser. No. 823,245

Int. Cl.² H01J *43/00*

U.S. Cl. 313—105 CM **4 Claims**



1. An electron multiplier component comprising a glass plate having a multiplicity of juxtapositioned channels extending from one face through the plate to an opposite face thereof, the inner wall of each channel being formed of a plurality of contiguous strips of glass extending along substantially the full length of the channel, said strips being alternately one of a glass having high electrical conductivity and another of a glass having high electron emissive properties and a matrix glass surrounding said strips.

4,031,424

ELECTRODE TYPE GLOW DISCHARGE APPARATUS

Alan S. Penfold, Playa del Rey, and John A. Thornton, Los Angeles, both of Calif., assignors to Telic Corporation, Santa Monica, Calif.

Division of Ser. No. 178,240, Sept. 7, 1971, Pat. No. 3,484,239. This application Mar. 3, 1975, Ser. No. 554,485

Int. Cl.² H01J *1/02, 1/44, 1/52, 21/22*

U.S. Cl. 313—146 **3 Claims**

1. Electrode-type glow discharge apparatus comprising:

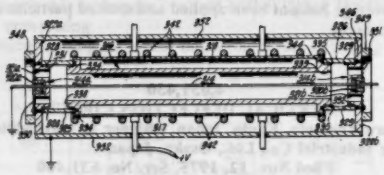
a low pressure gaseous environment;

anode means and cathode means within said low pressure gaseous environment and adapted to be coupled to a power supply;

said cathode means including a central cathode and a pair

of electrically conductive end flanges physically and electrically coupled with said cathode,

said cathode comprising an elongated member and said flanges comprising outwardly extending flanges electrically coupled with said elongated member, said elongated member being movable from outside said gaseous environment into said gaseous environment through and with respect to said flanges along the longitudinal axis of said flanges.



4,031,425
DISPENSER CATHODE FOR A GRID-CONTROLLED ELECTRON TUBE AND METHOD OF MANUFACTURING SAME

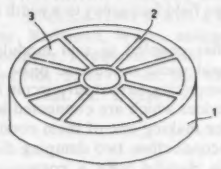
Reinhard Ziegler, and Horst Seifert, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1975, Ser. No. 619,061

Claims priority, application Germany, Oct. 19, 1974, 2449796

Int. Cl.² H01J *1/14, 19/06;* H01K *1/04*

U.S. Cl. 313—346 R **8 Claims**



1. A sintered dispenser cathode for a grid-controlled electron tube in which the emission of regions of the emissive surface of the cathode immediately opposite to the control grid is reduced, said cathode having projections above the emissive surface of fused pore-closed portions of reduced emission which have a focusing effect.

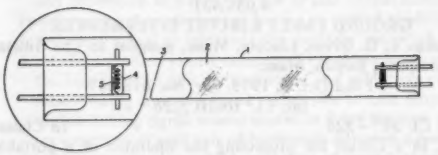
4,031,426
EMISSIVE COATING FOR ELECTRODES

Edmund R. Kern, Hampton, N.H., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Division of Ser. No. 487,409, July 10, 1974, Pat. No. 3,953,376. This application Dec. 15, 1975, Ser. No. 641,192

Int. Cl.² H01J *1/14;* D02G *3/00*

U.S. Cl. 313—346 R **2 Claims**



1. A cathode for electrical gas discharge devices comprising a tungsten coil and an electron emissive coating thereon said coil, said coating comprising barium tantalate having the composition five parts BaO to one part Ta_2O_5.

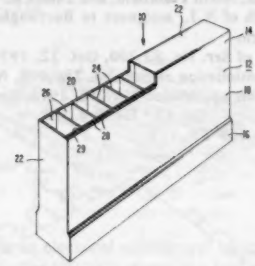
4,031,427
FLAT CATHODE RAY TUBE

Thomas Osborne Stanley, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,492

Int. Cl.² H01J *29/08, 31/00*

U.S. Cl. 313—422 **9 Claims**



1. An electron beam addressed device comprising:

an evacuated envelope having mutually spaced, substantially parallel, front and back walls,

a target adjacent to and substantially co-extensive with the front wall,

means for generating and directing electrons along at least one path extending between said front and back walls and substantially parallel to said target,

guide means disposed along the entire length of said path for creating electrostatic forces which confine the electrons in a beam which is spaced from the walls of the envelope,

means for deflecting said beam toward said target at selected points along said path, and

openings in said guide means through which the beam can pass when it is deflected toward said target.

4,031,428
DISCHARGE TUBE HAVING MULTIPLE ELECTRODES ARRANGED IN TANDEM

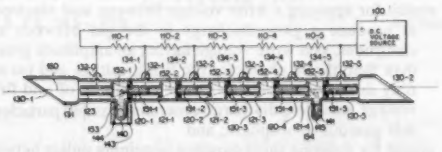
Katsumi Tokudome, Iruma, and Shuzo Hattori, Nagoya, both of Japan, assignors to Kimmon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1976, Ser. No. 666,907

Claims priority, application Japan, Mar. 13, 1975, 50-30331

Int. Cl.² H01S *3/22*

U.S. Cl. 315—111 **7 Claims**



1. A discharge tube comprising:

a vessel containing rare gas;

a plurality of electrodes having a cathodic part and anodic part therein and so arranged tandem in said vessel that a glow discharge is kept in a discharge gap between each said cathodic part and said anodic part of the preceding electrode, and that an optical path is provided to let

through each negative glow part of said glow discharge adjacent to said cathodic part;

means to apply a dc voltage across every said discharge gap in series; and

means to supply metal vapor to one of said glow discharge at the most low potential end of said means to apply dc voltage, whereby metal ions formed in said one of said glow discharge are carried down throughout said vessel.

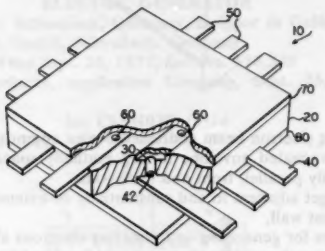
4,031,429
INFORMATION DISPLAY AND METHOD OF OPERATING WITH STORAGE

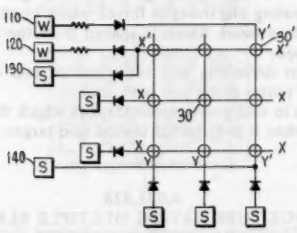
George E. Holz, North Plainfield, and James A. Ogle, Neshanic Station, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 83,200, Oct. 22, 1970, abandoned, which is a continuation of Ser. No. 780,099, Nov. 29, 1968, abandoned. This application May 12, 1976, Ser. No. 685,550

Int. Cl.² H05B *41/16*

U.S. Cl. 315—169 TV **44 Claims**





1. An information display system including

a glow discharge device comprising an envelope containing a gaseous atmosphere at a pressure capable of sustaining a glow discharge;

at least one anode electrode and one cathode electrode in operative relation with the gas disposed in said envelope, the combination of said gas and said anode electrode and cathode electrode having a characteristic firing voltage;

means for applying a write voltage between said electrodes to produce a glow discharge in the gas between said electrodes, said write voltage having an amplitude greater than that of said characteristic firing voltage and permissibly as much as about twice the amplitude of said firing voltage, said glow discharge generating excited particles in said gaseous atmosphere; and

means for applying short duration sustaining pulses between said electrodes starting after the termination of said write voltage and continuing at spaced intervals thereafter but while excited particles still present;

said sustaining pulses being of shorter duration than said write voltage but of sufficient duration to sustain said glow discharge while excited particles are still present; said sustaining pulses having an amplitude greater than that of said firing voltage and a duration and repetition rate sufficient to sustain said glow discharge at a favorable level of light output, current flow, and power dissipation but insufficient to cause arcing; the amplitude, duration, and repetition rate of said sustaining pulses being insufficient to produce said glow discharge if said write voltage has not been applied and excited particles are not present.

4,031,430
VERTICAL DEFLECTION CIRCUIT

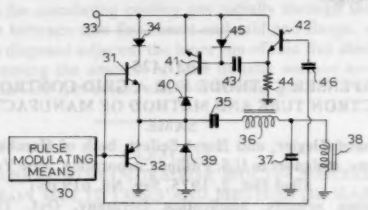
Shigeru Enomoto, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 12, 1975, Ser. No. 631,460

Claims priority, application Japan, Nov. 13, 1974, 49-131489; Dec. 5, 1974, 49-140277; Feb. 13, 1975, 50-18520

Int. Cl.² H01J *29/70*, *29/76*

U.S. Cl. 315—403 **5 Claims**



1. A vertical deflection circuit employing a class D amplifier comprising:

modulating means for converting a sawtooth waveform signal having a field frequency to a width modulated pulse train;

a pulse amplifier coupled to said modulating means for amplifying said width modulated pulse train, said pulse amplifier comprising an output circuit having a pair of switching devices which are connected in series and also connected for making one of them conductive while the other is nonconductive, two damping diodes each being connected in parallel with a corresponding switching device and reversely with respect to current flow through the switching devices, switching means connected in series with one of said damping diodes and which is nonconductive during a retrace period in said field frequency, and a forwardly biased diode coupled between one of said switching devices and a voltage supply source;

demodulating means for demodulating said width modulated pulse train to said sawtooth waveform, said demodulating means being composed of a filtering choke, a decoupling capacitor, one end of said choke being coupled to the connection between said switching devices through said decoupling capacitor, and a further capacitor coupled between the other end of the filtering choke and ground; and

a deflection yoke winding coupled between the connecting point between the filtering choke and said further capacitor, and ground.

4,031,431
GROUND FAULT CIRCUIT INTERRUPTER

Thomas A. O. Gross, Lincoln, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Oct. 1, 1975, Ser. No. 618,567

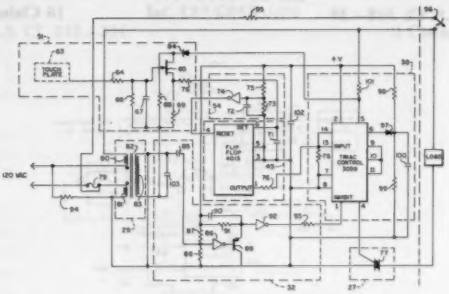
Int. Cl.² H02H *3/28*

U.S. Cl. 307—326 **18 Claims**

1. In a circuit for protecting the operator of a portable apparatus having an electrical load from an alternating current source having line and neutral conductor sides, circuit means capable of being electrically coupled between the

alternating current source and the electrical load for sensing a current imbalance in the line and neutral conductor sides and developing an output signal in response to the current imbalance, switching means for interrupting the current in the line conductor side in response to said output signal, the improvement comprising:

polarity sensing means for indicating if said switching means



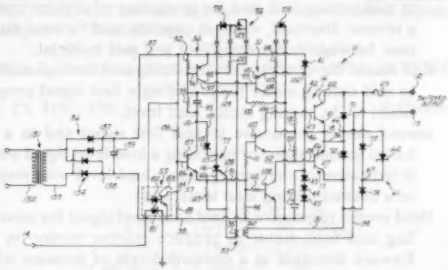
is electrically connected in series in the line conductor side when said circuit means is electrically connected to the alternating current source and means for permanently connecting the electrical load in series in a completed circuit with the switching means wherein the switching means is a solid state switch adapted to self-destruct prior to a lethal voltage developing across said permanently connected electrical load.

4,031,432

SOLID STATE SWITCHING CIRCUIT AND METHOD FOR SIMULATING A RELAY

Daryl F. Proctor, Redmond, Wash., assignor to Proctor and Associates Company, Redmond, Wash.

Filed Nov. 5, 1975, Ser. No. 629,127
Int. Cl.² H02H *7/20*
U.S. Cl. 361—7 **16 Claims**



1. A solid state switch comprising:

a pair of output terminals adapted to be connected in a circuit path which is to be switched between closed and open conditions;

a pair of like polarity transistors having their emitters connected in common and having their collectors individually connected to a separate one of said output terminals;

switching signal source means having an output producing a switching signal at selected, non-periodic times; and

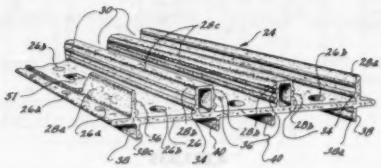
drive circuit means jointly connected to said emitters and to the bases of said pair of transistors, and said drive circuit means being connected and responsive to said output of said switching signal source means to drive the base emitter junctions of said pair of transistors between a forward biased condition in which said pair of output terminals connected to said collectors assume a relatively low impedance closed switch condition and a reverse biased condition in which said output terminals connected to said collectors assume a relatively high impedance open switch condition.

4,031,433

INSULATIVE MODULAR MOUNTING PANELS FOR ELECTRICAL SWITCHBOARDS

William Francis Olashaw, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Continuation of Ser. No. 474,761, May 30, 1974. This application Oct. 3, 1975, Ser. No. 619,241
Int. Cl.² H02B *1/20*
U.S. Cl. 361—338 **1 Claim**



1. For use in an electrical switchboard having vertical busbars for distributing electrical power to a load via an electrical device accommodated in a switchboard compartment, a modular insulative mounting panel comprising:

A. a base plate having opposed marginal side portions for mounting attachment to the switchboard;

B. a plurality of spaced parallel ribs outstanding from one side of said base plate to define three open, longitudinally elongated, parallel channel sections, said rib plurality including two pairs of contiguous inboard ribs separating adjacent channel sections said contiguous inboard ribs of each pair interconnected adjacent their free edges by an integrally formed, coextensive bridging segment spanning the space between adjacent channel sections, said contiguous rib pairs and bridging segments serving to increase the oversurface clearance between adjacent channel sections;

C. busbar mounting means formed in said channel sections;

D. means forming two longitudinally spaced sets of transversely aligned apertures in said base plate, the apertures of at least one set individually located in each said channel section; and

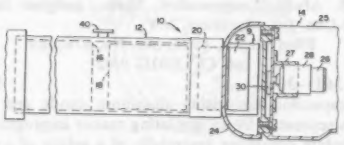
E. coextensive spacer ridges integrally formed on the surfaces of those of said ribs constituting sidewalls for adjacent channel sections.

4,031,434

KEYHOLE-LESS ELECTRONIC LOCK

Robert Richard Perron, Beverly, and John E. Trombly, Winchester, both of Mass., assignors to The Eastern Company, Naugatuck, Conn.

Filed Dec. 29, 1975, Ser. No. 644,947
Int. Cl.² E05B *47/00*
U.S. Cl. 361—172 **6 Claims**



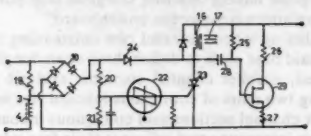
1. An electronic lock system comprising, in combination: key means including generating means for generating a plurality of binary frequency modulated carrier waves, first inductor means electrically connected to said generating means; lock means including lock inductor means positioned to induc-

tively couple with said key inductor means when said key means is in predetermined spatial relation to said lock means, signal distinguishing means electrically connected in circuit of said lock means and disposed to receive signals from said generating means whereby a predetermined sequence of binary signals is compared with the sequence of binary signals contained within the carrier from said generating means, motor means electrically connected in driven relation to said signal distinguishing means so that upon a corresponding comparison of said signal distinguishing means said motor means is activated, lock lug means connected in movable, driven relation to said motor means, whereby activation of said motor means causes movement of said lock lug means between a locked and unlocked position.

4,031,435
SWITCHING DEVICE

Dov Zioni, and Levi Y. Halperin, both of Jerusalem, Israel, assignors to Shaare Zedek Hospital, Jerusalem, Israel

Filed Apr. 8, 1976, Ser. No. 674,863
Int. Cl.² H01H *47/32*
U.S. Cl. 361—186 **9 Claims**



1. An indirectly activated electrical switching device comprising an inductor adapted to be periodically pulse-energized, an armature movable mounted with respect to said inductor so as to assume a first and a second position relative to said inductor thereby causing a distinct variation of current flow in said inductor when energized by said periodically applied pulse, a manipulative armature positioning means and an associated electrical circuit responsive to current flowing in said inductor and adapted to selectively actuate and external system only when said armature assumes one of said positions and a periodic energizing pulse has reached the inductor.

4,031,436
ELECTROLYTE CAPACITORS

Robert S. Alwitt, Longmeadow, Mass., assignor to United Chemi-Con, Inc., Syracuse, N.Y.

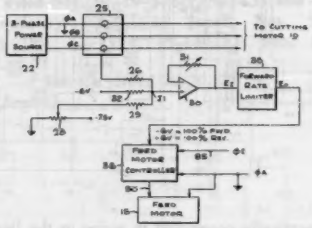
Filed May 9, 1975, Ser. No. 576,089
Int. Cl.² H01G *9/02*
U.S. Cl. 361—301 **9 Claims**

1. A capacitor comprising aluminum anode and cathode members separated by an insulating spacer impregnated with an electrolyte consisting essentially of a solute of a salt of a heteropoly acid of the class consisting of silicotungstic acid and silicomolybdic acid in a polar organic solvent, said salt being selected from the group consisting of alkali metal, ammonium, quaternary ammonium and amine salts, and said electrolyte having a pH of about 5 to about 7.2, said acid containing 1 silicon atom per 12 atoms of tungsten or molybdenum.

4,031,437
WORK AND FEED CONTROL SYSTEM FOR CUTTING MACHINES

Edward Justin Dempsey, Huntington Beach, and David Earl Kent, La Mirada, both of Calif., assignors to Concrete Cutting Equipment Inc., Hawthorne, Calif.

Filed July 10, 1975, Ser. No. 594,584
Int. Cl.² G05B *19/24*
U.S. Cl. 318—39 **16 Claims**



1. In a machine for cutting material an arrangement comprising;

a cutting tool;

a cutting motor to which said cutting tool is coupled for producing a cutting motion of said tool at a rate proportional to the level of current supplies to said cutting motor, which level is in turn proportional to the load level of said cutting motor which is related to the load of said cutting tool;

a bidirectional variable speed feed motor for producing relative motion in a forward direction between said cutting tool and material to be cut, thereby feeding material to said cutting tool, and for producing relative motion in a reverse direction, which is opposite said forward direction, between said cutting tool and said material;

first means for continuously detecting said level of current to said cutting motor for providing a first signal proportional to the cutting motor load level;

second means responsive to said first signal and to a selected second signal or providing a load level signal which is indicative of the cutting motor load level with respect to a desired cutting load level; and

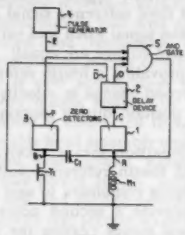
third means responsive to said load level signal for controlling said feed motor to produce relative motion in the forward direction at a controlled rate of increase when the cutting motor load level is less than said desired cutting load level, for controlling said feed motor to maintian the relative motion in the forward direction at a substantially constant level when the cutting motor load level is substantially equal to said desired load level, for controlling said feed motor to decrease the relative motion in the forward direction at a rate substantially equal to the rate of increase of the cutting motor load level from said desired level toward a threshold load level, for controlling said feed motor to produce relative motion in the reverse direction at rates related to the rates of change of the cutting motor load level when the latter exceeds said threshold load level, and for controlling said feed motor to produce relative motion in the forward direction, when said cutting motor load level decreases below said threshold load level, at an increasing rate which is substantially equal to either the rate of decrease of the cutting motor load level below said threshold load level or at a controlled rate of increase, whichever rate is smaller.

4,031,438

CONTROL DEVICE FOR THE ROTARY MOTOR OF A WATCH

Jean-Claude Berney, Lausanne, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Jan. 20, 1976, Ser. No. 650,737
Claims priority, application Switzerland, Feb. 11, 1975, 1631/75
Int. Cl.² G05B 5/00
U.S. Cl. 318—331 2 Claims



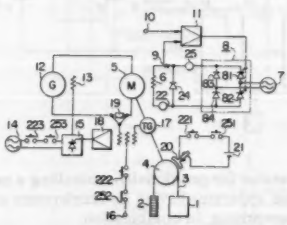
1. A control device for the rotary motor of a watch, comprising: a first zero detector, an input of which is connected to a coil of the motor and the output of which is connected to a delay device; a second zero detector, the input of which is connected to the coil of the motor via a capacitor, which may be short-circuited by a switch controlled by the output of the delay device; and a logic circuit, delivering driving pulses to the coil during the time in which the second detector and the delay device simultaneously deliver an output signal.

4,031,439

OVER-SPEED PREVENTING APPARATUS FOR DC MOTOR

Yoshio Sakai, and Toshiaki Kurosawa, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed July 11, 1975, Ser. No. 595,365
Claims priority, application Japan, July 19, 1974, 49-82215
Int. Cl.² H02P 7/06
U.S. Cl. 318—338 8 Claims



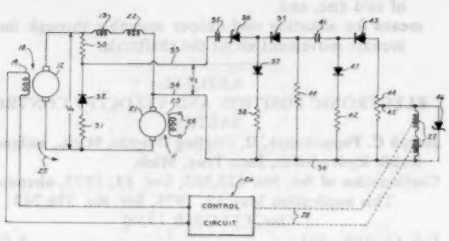
1. An over-speed preventing apparatus for a DC motor comprising a DC motor having a field winding and rectifier means including a rectifier circuit for supplying power to separately excite the field winding of said DC motor; said apparatus further comprising a unidirectional current conducting element connected in parallel to said field winding, current reduction detecting means connected in series between said parallel circuit, formed by said unidirectional current conducting element and said field winding, and said rectifier circuit for detecting reduction of the current therethrough to below a prescribed level, and protecting means responsive to said current reduction detecting means for preventing over-speed operation of said DC motor.

4,031,440

TRANSIENT LOAD DAMPING CIRCUIT FOR EXCAVATOR

Edward H. Christian, Brookfield; Donald M. Mains, Greendale, and James H. Treiber, Milwaukee, all of Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed May 20, 1976, Ser. No. 688,488
Int. Cl.² H02P 7/00
U.S. Cl. 318—432 14 Claims



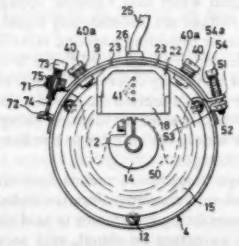
5. In an excavator drive system the combination comprising:
a drive motor having an armature, and a field winding connected in series with the armature;
a generator having an armature connected to said motor armature to form a loop which includes said motor and generator armatures and said motor field winding;
a voltage divider connected across said generator armature and including a pair of series connected resistors;
a feedback circuit having one input lead connected to the juncture of said voltage divider resistors and a second input lead connected to the juncture of said motor armature and its associated field winding, said feedback circuit including means for generating a feeback signal proportional to the second derivative of the signal applied to said input leads; and
a control circuit connected to effect the operation of said generator and connected to receive said feedback signal, said control circuit being responsive to said feedback signal to alter the operation of the generator.

4,031,441

OPTICAL ENCODER

David Aubrey Garrett, Sutton, England, assignor to Vactric Control Equipment Limited, England

Filed June 6, 1975, Ser. No. 584,385
Claims priority, application United Kingdom, June 7, 1974, 25445/74
Int. Cl.² G01D 5/36
U.S. Cl. 318—480 9 Claims



1. An optical encoder comprising
a housing capable of being secured to the end wall of a motor or rotating component about its shaft, said housing having a peripheral aperture and also an opening for receiving an end portion of said shaft;

a fixture for mounting an optical encoding disc rigidly on said shaft end portion,

a removable closure for said peripheral aperture of said housing,

a caliper assembly supported by said closure within said housing, said caliper assembly having opposite arms overlying opposite sides of said encoding disc, said arms carrying light-generating and light-sensitive elements, respectively, so that an electrical signal provided by said light-sensitive element is a function of the rotational movement of said disc, and

means for adjusting said caliper assembly through limited arcuate movement about the shaft axis.

4,031,442

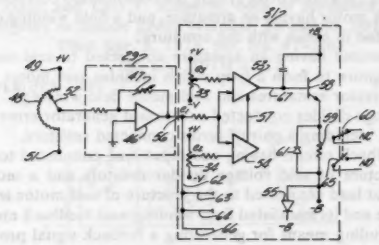
ELECTRONIC POSITION AND VELOCITY CONTROL SYSTEM

Joseph C. Poppelreiter, II, Sterling Heights, Mich., assignor to Kubik Hydradrives, Inc., Troy, Mich.

Continuation of Ser. No. 423,805, Dec. 11, 1973, abandoned. This application May 12, 1975, Ser. No. 576,743

Int. Cl.² G05B *13/00*

U.S. Cl. 318—561 **1 Claim**



1. A system for controlling the extent of movement of a movable member with respect to a fixed member and for effecting velocity changes at arbitrarily selected locations along the path of movement comprising:

means for providing a variable voltage, said variable voltage varying in direct relationship with the position of said movable member;

first means for providing a first reference voltage, said first reference voltage providing a level representative of a first arbitrarily selected location along said path of movement where a first change in velocity occurs, said first arbitrarily selected location being readily changeable over a widely variable range by changing said first reference voltage;

first voltage comparison means receiving said variable voltage and said first referene voltage and generating a comparison signal when said variable voltage and said first reference voltage are substantially equal;

second means for providing a second reference voltage, said second reference voltage providing a level representative of a second arbitrarily selected location along said path of movement where a second change in velocity occurs, said second arbitrarily selected location being readily changeable over a widely variable range by changing said second reference voltage;

second voltage comparison means receiving said variable voltage and said second reference voltage, said second voltage means being responsive to said comparison signal to provide an actuation signal, said second comparison means ceasing the provision of said actuation signal when said variable voltage substantially equals said second reference voltage;

utilization means responsive to said actuation signal, said utilization means changing the velocity of movement of said movable member when said first comparison means yields said comparison signal and stopping said movement when said second comparison means ceases provision of said actuation signal;

said motion being reciprocal between preselected start and stop points and wherein said second reference voltage means establishes the stop point for motion in one direction and the start point for motion in the order direction and further including:

third means for providing a third reference voltage having a level indicative of an arbitrarily selected third position for a velocity change during motion in the opposite direction;

third voltage comparison means receiving said variable voltage and said third reference signal and generating a second comparison signal when said variable voltage and said third reference voltage are equal;

fourth means for providing a fourth reference voltage for establishing a second change in velocity at a fourth arbitrarily selected position during motion in the opposite direction;

fourth voltage comparison means receiving said variable voltage and said fourth reference voltage, said fourth voltage means being responsive to said second comparison signal to provide a second actuation signal, said fourth comparison means ceasing the provision of said second actuation signal when said variable voltage substantially equals said fourth reference voltage; and

---

4,031,443

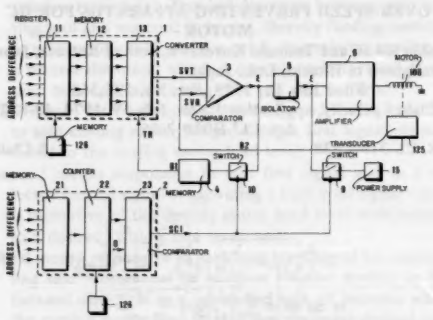
APPARATUS FOR POSITIONALLY CONTROLLING A MOVABLE HEAD ASSEMBLY

Jacques Pierre Léon Droux, Paris, and René Jean Rodier, Bobigny, both of France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed May 22, 1975, Ser. No. 579,862

Int. Cl.² G05B *13/00;* **G11B** *21/08*

U.S. Cl. 318—561 **7 Claims**



1. An apparatus for positionally controlling a movable head assembly, said apparatus having an acceleration and deceleration state, comprising, in combination:

a motor drivingly connected to said movable head assembly;

transducer means for producing a velocity signal representing the speed of said movable head assembly;

a first and second switch;

an isolator

a power supply connected to said motor through said first switch;

first memory means for setting a series of theoretical velocities for said movable head assembly, said first memory means producing a series of theoretical velocity signals representing said theoretical velocities, said first memory means defining a series of arbitrary velocity signals;

means for comparing said theoretical velocity signals and said velocity signal to produce an error signal, said comparing means including a pair of inputs connected to said

first mémory méans and said transducer means, respectively, and an output connected to said motor through said isolator;

second memory means for producing a reference signal in response to said error signal, said second memory means being connected to said output of said comparing means through said second switch, said first memory means being connected to said second memory means for receipt of said reference signal, said theoretical velocity signals being the product of said arbitrary velocity signals and said reference signal; and

means for controlling inversion between said acceleration and deceleration states, said first and second switches being connected and responsive to said controlling means, said controlling means closing said first and second switches is said acceleration state, whereby said second memory means continually receives said error signal, said motor is connected to said power supply to drive said movable head assembly under substantially free conditions, and said isolator isolates said comparing means from said power supply, said controlling means opening said first and second switches in said deceleration state, whereby said second memory means stores said error signal at inversion, said reference signal becomes constant, and said motor is connected to said output of said comparing means to drive said movable head assembly in response to said error signal, whereby said velocity signal tracks said theoretical velocity signals.

4,031,444

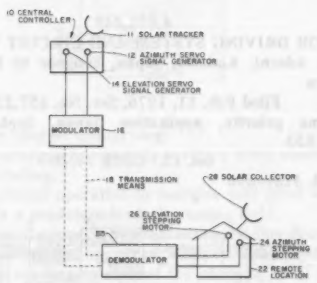
SOLAR COLLECTOR CONTROL SYSTEM

Earl J. Beck, Jr., Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1975, Ser. No. 624,148

Int. Cl.² G05B *11/32*

U.S. Cl. 318—562 **7 Claims**



1. A solar collector control system comprising:

a. means for tracking the sun as it traverses in an arc across the sky;

b. servo means for producing two sets of intermittent stepping signals representative of azimuth and elevation of said means for tracking;

c. means for multiplexing said signals for transmission to remote locations;

d. means for demultiplexing said signals at said remote locations; and

e. stepping means for controlling the azimuth and elevation of solar collectors at said remote location in response to said signals.

4,031,445

CONTROL ARRANGEMENT FOR A CAM PRODUCTION MACHINE

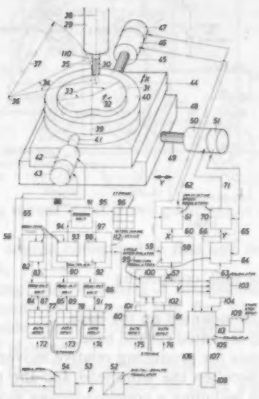
Alfred Schmermund, 62, Kornerstrasse, 5820 Gevelsberg, Germany

Filed Aug. 21, 1975, Ser. No. 606,827

Claims priority, application Germany, Aug. 26, 1974, 2440775

Int. Cl.² G05B *19/42*

U.S. Cl. 318—568 **7 Claims**



1. An automatic milling or grinding machine comprising in combination:

a frame;

tool support means supported on said frame;

workpiece support means mounted on said frame to be rotationally and rectilinearly displaceable relative thereto;

rotational drive means to rotate said workpiece support means;

first drive means to rectilinearly displace said workpiece support means in a first co-ordinate direction in a plane perpendicular to the axis of rotation of said workpiece support means;

second drive means to rectilinearly displace said workpiece support means in a second co-ordinate direction in said plane and perpendicular to said first co-ordinate direction;

first storage means to store information relating to a law of a camming surface to be formed on said workpiece by said machine;

second storage means to store information relating to workpiece-dependent parameters for determining dimensional characteristics of given portions of said camming surface;

co-ordinator means to operatively associate with one another related items of information derived from each of said first and second storage means thereby to generate a succession of angle information signals, said succession defining a circular arc corresponding to one on which the axis of rotation of a roller follower of given dimensions would move on following said camming surface; and

command signal generator means connected to said co-ordinator means and responsive to said angle information signals to apply respective command signals to each of said first and second rectilinear drive means thereby to cause said workpiece to be displaced relative to said tool along said circular arc.

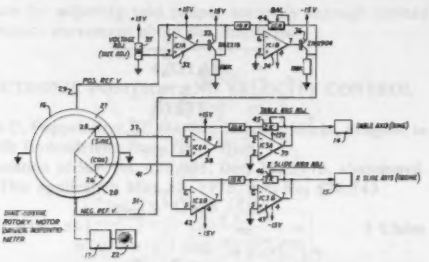
4,031,446
MACHINE TOOL

Arthur Francis St. André, Marlboro; Joseph David LeBlanc, Holden, and Edward George Robillard, Cherry Valley, all of Mass., assignors to Cincinnati Milacron-Heald Corporation, Worcester, Mass.

Continuation of Ser. No. 395,917, Sept. 10, 1973, abandoned. This application July 31, 1975, Ser. No. 600,903

Int. Cl.² G05B *1/06*

U.S. Cl. 318—665 **5 Claims**



1. A machine tool, comprising

a. a base,

b. a workhead mounted on the base,

c. a toolhead mounted on the base,

d. a first means for producing relative movement in a first direction between the workhead and the toolhead, said first means including a constant-torque motor,

e. a second means for producing relative movement between the workhead and the toolhead in a second direction perpendicular to the first direction, said second means including a constant-torque motor, the first means and the second means each including an electrical servo motor receiving a signal from one of the said portions and operating through a ball-screw mechanism to produce the said respective relative movement between the workhead and the toolhead,

f. a first and second potentiometer portion, at least one portion having non-linear resistance and a contactor associated with each portion, the portions of the potentiometer being circular and concentric with a shaft for driving the contactors, the electrical signal developed by one portion of the potentiometer varying as the sine of the angle of the shaft, while the electrical signal developed by the other portion varies as the cosine of the angle, and

g. a motor driving the contactors together at the same constant and predetermined speed, thus causing the potentiometers to develop two separate and continuous electrical signals, each signal varying in accordance with the nature of its respective portion, one signal controlling the speed of one motor and the other signal controlling the speed of the other motor, each motor bringing about the said relative movement at a velocity proportional to the voltage developed by its portion of the potentiometer.

4,031,447
IMPROVED CONTROL SYSTEM FOR ENERGIZING A STEPPING MOTOR

Masaaki Togo, Kawasaki; Masao Shima, Shinagawa, and Kiyoshi Mochizuki, Kamakura, all of Japan, assignors to Yamatake-Honeywell Company Limited, Tokyo, Japan

Filed June 27, 1975, Ser. No. 591,117

Claims priority, application Japan, July 2, 1974, 49-75004

Int. Cl.² H02K *37/00*

U.S. Cl. 318—685 **7 Claims**

1. A control system for energizing a stepping motor for bidirectional rotational comprising in combination:

a comparactor circuit with two input means and and output means;

an input signal and a feedback signal;

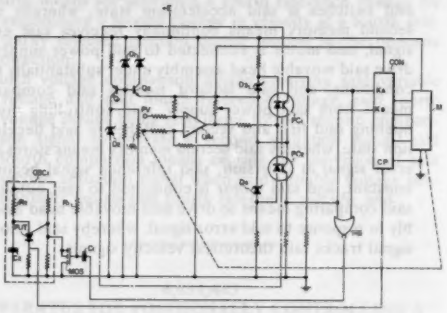
means for coupling the input signal to said one of said input means and the feedback signal to the other of said input means;

a stepping motor;

means for energizing said stepping motor;

means responsive to an output of said comparator for periodically coupling said energizing means to said stepping motor;

said responsive coupling means including a clock pulse generator, the pulse width of which determines the energy coupled to said motor is stepping;



said coupling means coupling said energizing means to said motor to cause rotation in one direction in response to an output of said comparator at one level;

said coupling means coupling said energizing means to said motor to cause rotation in the opposite direction in response to an output of said comparator at another level;

said coupling means for decoupling said energizing means from said motor in response to an output of said comparator which is between said levels; and

means for increasing the width of said clock pulses for a predetermined period in response to the output of said comparator initially reaching said one level.

4,031,448
MOTOR DRIVING SYSTEM AND CIRCUIT THEREFOR

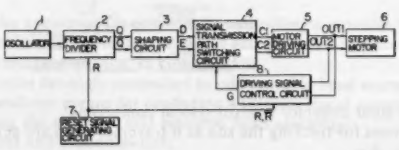
Yoshio Adachi, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 11, 1976, Ser. No. 657,235

Claims priority, application Japan, Sept. 26, 1975, 50-115633

Int. Cl.² G05B *19/40*

U.S. Cl. 318—696 **17 Claims**



1. A motor driving system comprising:

a reference signal generating circuit for generating a pair of reference signals of different phase from each other;

a motor driving circuit responsive to said pair of reference signals for producing a pair of motor driving signals for causing drive currents of opposite polarity to each other to be alternately fed to a motor;

a signal transmission path switching circuit connected between said reference signal generating circuit and said

motor driving circuit for switching the paths which transmit said reference signals to said motor driving circuit;

a control circuit for receiving said motor driving signals at an input thereof and supplying an output thereof as a control signal to said signal transmission path switching circuit, and

a reset circuit connected to said reference signal generating circuit and said control circuit for generating a reset signal which deactuates said reference signal generating circuit and causes said control circuit to produce and maintain an output signal corresponding to the status of the motor driving signals,

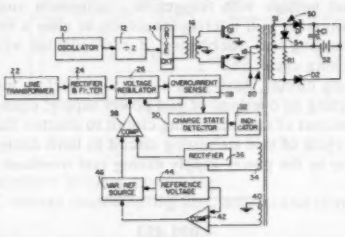
whereby the signal transmission path corresponding to the status of the motor driving signal at the time of the reset is selected and the reference signal is transmitted to the motor driving circuit through the selected signal transmission path at the release of the reset.

4,031,449

ELECTROMAGNETICALLY COUPLED BATTERY CHARGER

John E. Trombly, Winchester, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Nov. 20, 1975, Ser. No. 633,987
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—2 14 Claims



1. A battery charger comprising:

a first electromagnetic assembly having a drive winding and a sense winding;

a charging circuit operative to energize said drive winding to provide a predetermined alternating field;

a control circuit connected to said sense winding and to said charging circuit and operative in response to a signal from said sense winding to control the charging level of said charging circuit;

an electromagnetic receiver assembly connectable to a battery to be charged and adapted for electromagnetic coupling to said assembly; and

means operative in response to the presence of said receiver assembly in coupling relationship with said first assembly to enable full power operation of said charging circuitry, including:

a proximity winding operative to provide a signal upon coupling of said receiver assembly and said first assembly; and

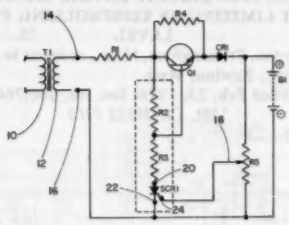
means operative in response to said proximity winding signal to provide an enabling signal to cause full power operation of said charging circuit.

4,031,450

TWO STEP SOLID STATE BATTERY CHARGER

Ronald O. Hammel, Denver; Charles N. Kuykendall, Boulder, and William A. Fischer, Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Mar. 26, 1971, Ser. No. 128,430
Int. Cl.[3] H02J 7/10
U.S. Cl. 320—23 17 Claims



1. Charging means for delivering current to a battery comprising:

a. a power source connected to first and second charging terminals;

b. a charging path including a semiconductor switching means connected between said first charging terminal and one side of said battery, said switching means having a control terminal;

c. a shunt path between said first and second charging terminals including a resistor in series with a controlled rectifier having a gate electrode, a cathode connected to said second charging terminal, and an anode connected to said resistor and forming a juncture therebetween, said juncture connected to said control terminal of said switching means;

d. a voltage divider connected across said battery, said gate electrode connected to said voltage divider at a preselected dividing point;

e. said second charging terminal connected to the other side of said battery;

f. whereupon charging, current is supplied to the battery through the charging path, and when the battery reaches its pre-selected end of the charge voltage, sufficient potential is impressed across the gate-cathode junction to the controlled rectifier to render it conductive and thereby shunt current away from the battery;

g. said controlled rectifier provided with means other than or in addition to self-heating for increasing its temperature during conduction to lower the gate-cathode potential required to render the controlled rectifier conductive, and thereby latching said switching means into non-conduction and reducing the battery voltage to a safe limit to prevent overcharging.

15. In a method of charging a battery of one or more electrochemical cells utilizing circuitry comprising a power source provided with input terminals, a semiconductor switching means connected between the power source and battery, a shunt path connected across said power source and including a resistive element and controlled rectifier having a control terminal, and a voltage divider connected across said battery and having a juncture point connected to said control terminal, the improvement comprising:

substantially freely heating said controlled rectifier below its destruction point, commencing heating only when the battery has attained a nearly fully charged state corresponding to a given end of charge voltage exhibited by the battery, said heating of the controlled rectifier being provided by placing said resistive element in thermal conductive relationship with said controlled rectifier;

reducing the battery voltage below said end of charge voltage; and thereafter

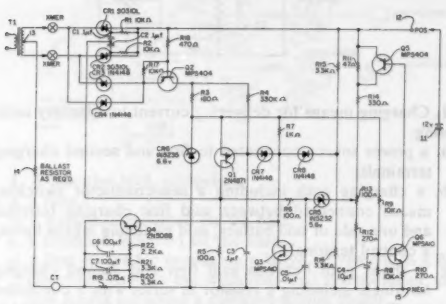
continuously maintaining the battery voltage level below

said end of charge voltage to prevent overcharging the battery while simultaneously tapering charging current to safety bring the battery to its fully charged state.

4,031,451
CHARGING CIRCUIT WITH SCR'S TRIGGERED BY PEDESTAL AND COSINE MODIFIED RAMP UNIJUNCTION CIRCUIT HAVING MEANS FOR CURRENT LIMITING BY CONTROLLING PEDESTAL LEVEL

Peter H. Gordon, Framingham, Mass., assignor to Alkon Laboratories, Inc., Newton, Mass.

Filed Feb. 23, 1976, Ser. No. 660,764
Int. Cl.² H02J 7/10
U.S. Cl. 320—23 **9 Claims**



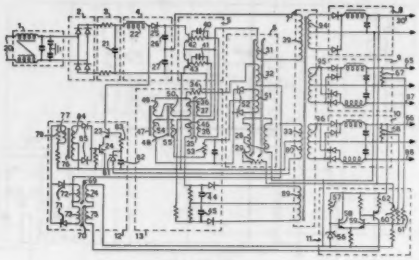
1. Electrical battery charging apparatus comprising,
input terminal means for receiving A.C. energy,
output terminal means for receiving a potential from a battery to be charged,
gated rectifier means intercoupling said input and output terminal means for converting said A.C. energy into D.C. energy for charging said battery,
a pedestal and cosine modified ramp unijunction trigger circuit having a unijunction transistor with an emitter connected to an emitter capacitor and means for charging said capacitor to a predetermined pedestal level for controlling the time when said unijunction trigger circuit provides trigger pulses, and circuit means for controlling said pedestal voltage
said circuit means including means responsive to the charging current delivered by said output terminal means for limiting said charging current to less than a predetermined value,
wherein said circuit means for controlling said pedestal voltage furthur includes means responsive to a discharged condition of a battery connected to said output terminal means and/or a high voltage upon said input terminal means for establishing said pedestal voltage at a level which prevents triggering of said gated rectifier means until the potential then on said input terminal means is decreasing from its peak value during that cycle to a value low enough so that the peak current through said gated rectifier means is always less than a predetermined value.

4,031,452
STABILIZED POWER SUPPLY

Pier Luigi Longa, Pavone Canavese (Turin), and Piero Gamba, Banchette (Turin) both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Oct. 6, 1975, Ser. No. 620,129
Claims priority, application Italy, Oct. 29, 1974, 70201/74
Int. Cl.² H02M 7/04
U.S. Cl. 321—2 **4 Claims**

1. A switching power supply coupled to AC mains for supplying a stabilized DC output voltage to an electronic apparatus, comprising:
a rectifying circuit having an input connected directly to said AC mains;
a voltage stabilizing circuit including a storage inductor, and an arrangement of a diode and a capacitor in series with said inductor for generating a DC stabilizing voltage;
said rectifying circuit having an output connected to said inductor;
a frequency generating means for generating a frequency higher than the AC mains frequency;
an interrupter circuit, having a switching cycle of constant repetition rate controlled by said frequency generating means, connected in parallel with said diode and said capacitor whereby said inductor is caused to store magnetic energy during a charging interval of said switching cycle corresponding to closing of said interrupter circuit, and whereby the magnetic energy stored in said inductor is transferred to said capacitor through said diode during a discharging interval of said switching cycle corresponding to opening of the said interrupter circuit;

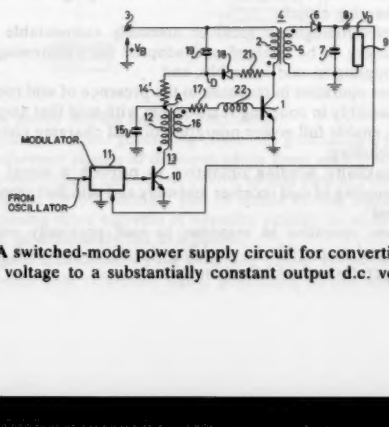


means responsive to the deviation of said stabilized DC output voltage with respect to a reference voltage for conditioning said interrupter circuit to alter a time ratio of charging and discharging of said inductor within said switching cycle; and
a limiting circuit, having an overload detecting means for detecting an overload of said power supply, connected to the output of said stabilizing circuit to shorten the repetition cycle of said stabilizing circuit to limit dissipation of power in the power supply during said overload.

4,031,453
TRIGGERED TRANSISTOR SWITCHING REGULATOR

Dirk Johan Adriaan Teuling, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,736
Claims priority, application Netherlands, Dec. 2, 1974, 7415666
Int. Cl.² H02P 13/22
U.S. Cl. 321—2 **10 Claims**



1. A switched-mode power supply circuit for converting an input voltage to a substantially constant output d.c. voltage

comprising, a switching device, a driver stage for supplying a periodic pulse-shaped control signal to a control electrode of said switching device to render it conducting during a first part of the control signal period and to block it during a remaining second part of the period, means for controlling the duration of said parts of the period, means connecting an output electrode of an switching device to a terminal of the input voltage source through a self-inductance, a rectifier, a smoothing capacitor, means coupling one electrode of said rectifier to said self-inductance, means connecting the other electrode of the rectifier to said smoothing capacitor and to a supply resistor for the driver stage so that the direct current power supply voltage for the driver stage is supplied thereto from said terminal of the input voltage source via said supply resistor.

4,031,454

TRANSISTOR INVERTER

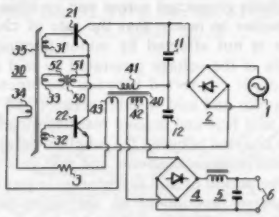
Tadao Suzuki; Tadao Yoshida, and Shigeaki Wachi, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 1, 1976, Ser. No. 691,827

Claims priority, application Japan, June 6, 1975, 50-68708

Int. Cl.² H02M *3/335*

U.S. Cl. 321—2 **8 Claims**



1. A transistor inverter comprising:

a. a DC voltage source having first, second and third terminals;

b. an output transformer having primary and secondary windings;

c. a pair of first and second transistors each having base, emitter and collector electrodes, each of the collector and emitter electrodes of said first and second transistors being connected between the first and second terminals of said DC voltage source and between the second and third terminals of said DC voltage source through the primary winding of said output transformer, respectively;

d. an input transformer having a voltage feedback winding, a pair of voltage control windings and a saturable core;

e. circuit means for coupling the voltage across said primary winding of said output transformer to said voltage feedback winding and connecting each of the voltage control windings of said input transformer between the base and emitter electrodes of said first and second transistors, respectively;

f. DC voltage output means connected to the secondary winding of said output transformer, and

g. means for feeding back one part of the primary current flowing through the primary winding of said output transformer to said input transformer, the last mentioned means further including means for producing a predetermined desired amount of said current feedback.

4,031,455

EXCITATION CIRCUIT FOR BRUSHLESS SYNCHRONOUS WELDING GENERATORS

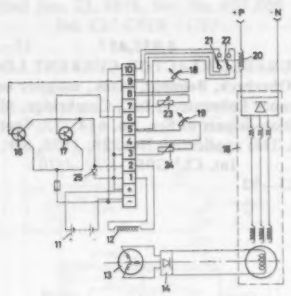
Dieter Beck, Etzenrod, Germany, assignor to Firma A. van Kaick "AvK" Generatoren- und Motorenwerke, Neu-Isenburg, Germany

Filed Nov. 25, 1975, Ser. No. 635,096

Claims priority, application Germany, Nov. 25, 1974, 2455643

Int. Cl.² H02P *9/10, 9/38*

U.S. Cl. 322—27 **5 Claims**



1. In a brushless synchronous welding generator having a three-phase exterior-pole exciter machine including a stator-mounted excitation winding supplied from a separate d. c. voltage source and a three-phase rotor winding connected to a rectifier, an excitation control circuit comprising:

two power transistors arranged in parallel between said voltage source and the excitation winding, one being operative in the idling mode, the other in the welding mode of the machine;

switching means for alternatingly activating one transistor and blocking the other in response to the flow or absence of flow of welding current in the welding generator in the welding and idling modes, respectively; and

means for independently adjusting the base potential of each transistor.

4,031,456

CONSTANT-CURRENT CIRCUIT

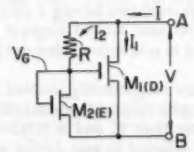
Shunji Shimada, Kodaira; Yoshikazu Hatsukano, Hachioji, and Osamu Yamashiro, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 28, 1975, Ser. No. 608,731

Claims priority, application Japan, Sept. 4, 1974, 49-100916

Int. Cl.² G05F *3/08*

U.S. Cl. 323—4 **4 Claims**



1. A constant-current circuit wherein a depletion type FET M_1 and a series circuit consisting of impedance means and an enhancement type FET M_2 are connected between two terminals A and B and wherein gate electrodes of the respective FET's M_1 and M_2 are connected to a juncture between said impedance means and said FET M_2, characterized in that a current I_1 which flows through said FET M_1 is set to be suffi-

ciently large in comparison with a current I_2 which flows through said series circuit, and that a voltage across said FET M_2 is made substantially equal to a threshold voltage of this FET M_2.

4,031,457

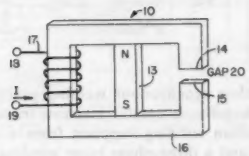
SATURABLE REACTOR CURRENT LIMITER

George A. Oberbeck, Belmont, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 614,773, Sept. 19, 1975, abandoned. This application Nov. 28, 1975, Ser. No. 635,895

Int. Cl.² G05F 1/32, 1/70

U.S. Cl. 323—92 21 Claims



1. A device for limiting current in an electric circuit comprising:

A. at least three magnetic circuit branch elements extending between two nodes:

i. the first of said branch elements being characterized by a permeance P_1,

ii. the second of said branch elements being characterized by a non-linear permeance P_2 and having saturated and non-saturated states, wherein P_2 is greater when said second element is in said non-saturated state than when in said saturated state, and wherein the magnetic flux density of said second element is equal to a saturation flux density which is relatively invariant with respect to magneto-motive force applied across said second element when in said saturated state, and said magnetic flux density is less than said saturated flux density otherwise,

iii. the third of said branch elements is characterized by a permeance P_3 and includes a magneto-motive force (mmf) bias means for establishing a substantially constant magnetic flux density in said third element,

B. an input coil including means for electrically coupling said device to said electric circuit so that said current passes therethrough, said coil having a plurality of windings extending about said second element so that magnetic flux is induced in said second element in response to said current,

wherein said elements are magnetically coupled at said nodes, and P_1 is relatively high with respect to the medium external to said device, P_2 is greater than P_1 and is relatively high with respect to the medium external to said device when said second element is non-saturated, and P_3 is relatively low with respect to P_1 and P_2 when said second element is non-saturated, and

wherein further the net magnetic flux density in said second element is equal to the saturation flux density for said second element when said current is below a predetermined threshold, and said net flux density is below said saturation flux density when said current is in a predetermined range above and extending from said threshold.

4,031,458

A.C. VOLTAGE REGULATOR EMPLOYING THYRISTOR

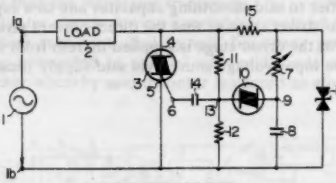
Kazuo Ichikawa, Minowa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1976, Ser. No. 666,335

Claims priority, application Japan, Mar. 20, 1975, 50-33725

Int. Cl.² G05F 1/44

U.S. Cl. 323—36 2 Claims



1. A phase controlled a.c. voltage regulator for regulating the voltage applied to a load connected in series with an a.c. source, said voltage regulator comprising:

a bilateral thyristor having first and second anodes and a gate, said first and second anodes being connected to first and second terminals across which a load and an a.c. source may be connected;

a voltage divider comprising first and second resistive elements connected in series across said first and second terminals;

a timing circuit including a thrid resistive element, a variable resistor, and a capacitor connected in series across said first and second terminals and a bilateral constant voltage diode connected across said variable resistor and said capacitor to insure that the rate of charge of said capacitor is not affected by minor fluctuations in the magnitude of the voltage generated by said a.c. source;

a bilateral diode connected between the junction between said capacitor and said variable resistor and the junction between said first and second resistive elements;

a capacitor coupled between the junction between said first and second resistive elements and said gate whereby the conductive period of said thyristor increases or decreases as an inverse function of an increasing or decreasing power supply voltage so as to apply a substantially constant effective voltage to said load.

4,031,459

INDUCTIVE VOLTAGE TRANSFORMER FOR A HIGH-VOLTAGE METAL-CLAD SWITCH-GEAR INSTALLATION

Jurgen Moeller, Memmelsdorf; Werner Mitrach, Bamberg; Helmut Krauss, Geisfeld, and Hubert Schulte, Bischberg, all of Germany, assignors to Messwandler-Bau GmbH, Germany

Filed Oct. 30, 1975, Ser. No. 627,272

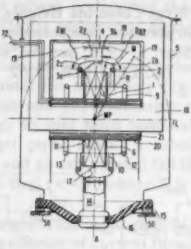
Claims priority, application Germany, Nov. 2, 1974, 2452056

Int. Cl.² H01F 15/04

U.S. Cl. 323—60 45 Claims

1. An inductive voltage transformer insulated by an insulating gas and including a pressure vessel means and a high-voltage winding means which is surrounded by a high-voltage electrode means, the insulating gas within the pressure vessel means forming the high-voltage insulation, characterized in that the high-voltage electrode means is axially drawn over the winding end faces of at least a part of the high-voltage winding means, said high-voltage electrode means including a central portion surrounding the winding cross section of the high-voltage winding means as well as edge portions axially projecting over the high-voltage winding means, said central portion and said edge portions being so curved that the outer surfaces

thereof together with adjacent wall portions of the pressure vessel means form at least approximately a Rogowski-profile projected on a cylinder area, said central portion of said high-voltage electrode means and the adjacent wall portions of the

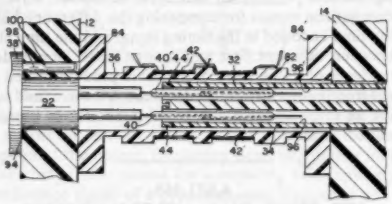


pressure vessel means representing in cross section concentric partial circles having at least approximately a common center point of curvature with said edge portions of said high-voltage electrode means having smaller radii of curvature than said central portion so as to form a Rogowski-profile.

4,031,460
DEVICE FOR MEASURING THE MAGNETIC FLUX DISTRIBUTION ALONG THE LENGTH OF ELONGATED MAGNETIZED ELEMENT

Khaja M. Jameel, Glen Ellyn; Von W. Mueller, Elk Grove Village, and Ronald A. Foerster, Carol Stream, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 31, 1975, Ser. No. 627,634
Int. Cl.² G01R *33/12*
U.S. Cl. 324—34 R **14 Claims**

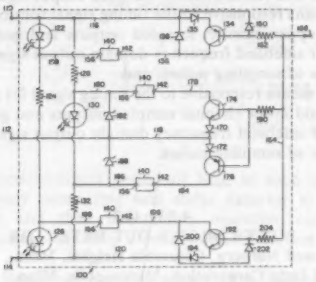


1. An apparatus for use in the measuring magnetic flux distribution along a magnetic member which is in the form of an elongate rod of relatively small cross sectional diameter, said apparatus comprising a support frame having a plurality of upstanding post forming support members spaced along a linear path, an elongate rod member constituting a thrust arm supported by said post members for reciprocating movement along said linear path between extended and retracted positions, drive means for reciprocating said thrust arm, said thrust arm having a hollow end portion of a length and cross section which will accommodate in telescoped relation therein said magnetic rod member, means for supporting said magnetic rod member in axial alignment with said hollow end portion of said thrust arm so as to be telescoped within said hollow end portion when said thrust arm is extended, bobbin forming means having a hollow tubular core portion of a cross section which will receive in telescoped relation said hollow end portion of said thrust arm and mounted in telescoping relation to said magnetic member, said bobbin forming means adapted to have wound thereon an energizing coil for said magnetic member, a search coil having an axial dimension only a small fraction of the length of the magnetic member, mounted on the hollow end portion of said thrust arm so as to sweep along the length of said magnetic member upon retractive member of said thrust arm, and means associated with said search coil and said thrust arm for sensing and recording magnetic flux values at discrete points along the length of the magnetic member and the position of said search coil along said magnetic member as said thrust arm is reciprocated and correlating the two measurements.

4,031,461
SOURCE RELATED POTENTIAL INDICATING CONTINUITY TESTER

Carl Casper Reiner, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Jan. 23, 1976, Ser. No. 651,808
Int. Cl.² G01R *31/02*
U.S. Cl. 324—51 **48 Claims**

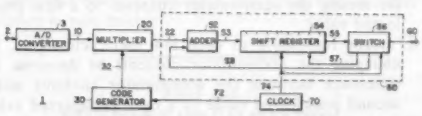


1. A detector for determining continuity in an electrical circuit between a selected point in the circuit and an electrical source in the circuit, said source having first and second source potentials, comprising: probe means adapted to be placed in contact with the selected point; first and second connector means adapted to be connected respectively to the first and second source potentials; first indicator means connected to the probe and first connector means responsive to the potentials thereat to provide a first digital, off-on indication when the potentials are approximately equal thereby indicating continuity in the circuit between the point and first source potential; and second indicator means connected to the probe and second connector means responsive to the potentials thereat to provide a second digital, off-on indication when the potentials are approximately equal thereby indicating continuity in the circuit between the point and second source potential.

4,031,462
FREQUENCY SPECTRUM ANALYZER

David William Bouvier; William Geary Green, both of Tempe, and Randolph Gaylon Moore, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed July 7, 1975, Ser. No. 593,830
Int. Cl.² G01R *23/16*
U.S. Cl. 324—77 B **18 Claims**



1. An apparatus for analyzing in real time the frequency spectrum of an incoming signal of unknown frequency characteristics which has been separated into two quadrature components, comprising:

means for receiving and limiting the amplitude of each quadrature component;

means for generating a timing signal;

means responsive to the timing signal for generating first and second trains of sampling pulses in repetitive frames, wherein each frame of said first and said second trains of sampling pulses represents a series of cross-correlation functions in terms of a predetermined number of sampling intervals and a predetermined number of harmonics;

first means for multiplying said first train of sampling pulses with said first quadrature signal component to generate a first train of discrete sampled outputs;

second means for multiplying said second train of sampling pulses with said second quadrature signal component to generate a second train of discrete sampled outputs;

means for separating said first and said second train of discrete sampled outputs into two completely separated upper and lower channel sampled output signals;

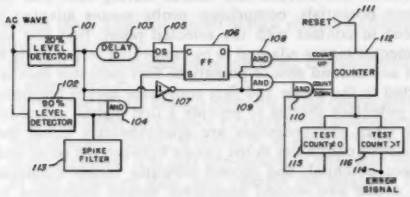
first means responsive to the timing signal for accumulating said upper channel sampled outputs and generating an upper sideband frequency domain output signal for each frame of sampling pulses; and

second means responsive to the timing signal for accumulating said lower channel sampled outputs and generating a lower sideband frequency domain output signal for each frame of sampling pulses.

4,031,463
POWER BROWN-OUT DETECTOR

Gayle Russell Norberg, Columbia Heights, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Mar. 1, 1976, Ser. No. 662,315
Int. Cl.² G01R 23/16
U.S. Cl. 324—77 A **11 Claims**



1. Apparatus for providing a brownout signal indicating low power in an AC wave having a nominal peak voltage, and comprising

a. voltage detecting means receiving the AC wave, for providing a low half-cycle signal each time the maximum AC wave excursion from 0 falls between a first predetermined voltage level and a second predetermined voltage level greater in magnitude than the first, and a normal half-cycle signal each time the maximum AC wave excursion is at least as great in magnitude as the second predetermined voltage level; and

b. an accumulator receiving the low and normal half-cycle signals, comprising

i. means responsive to an externally supplied reset signal, for setting the accumulator contents to a first preselected value,

ii. means responsive to each low half-cycle signal, for changing the accumulator contents to decrease the difference between the accumulator contents and a second preselected value by a third preselected value,

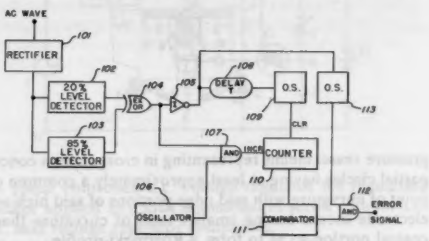
iii. means responsive to each normal half-cycle signal, for changing the accumulator contents to increase the difference between the accumulator contents and the second preselected value by a fourth preselected value whenever the accumulator contents are exclusively between the first and second preselected values, and

iv. means for issuing the brownout signal whenever the difference between the second and first preselected values is exceeded by the difference between the accumulator contents and the first preselected value.

4,031,464
LINE POWER DISTORTION DETECTOR

Gayle Russell Norberg, Columbia Heights, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Mar. 1, 1976, Ser. No. 662,318
Int. Cl.² G01R 23/02
U.S. Cl. 324—78 Z **7 Claims**



1. Apparatus for detecting distortion in a phase of an AC power wave of predetermined nominal frequency and peak amplitude, comprising

a. voltage detecting means receiving the AC wave for providing a first signal when the AC wave reaches a preselected first percentage of nominal peak amplitude and a second signal when the AC wave reaches a preselected second percentage of nominal peak amplitude, said second percentage being greater than the first;

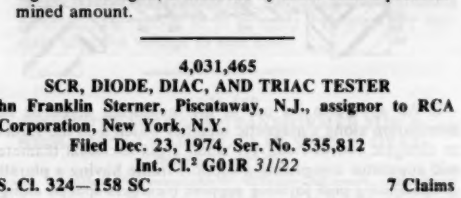
b. timing means receiving the voltage detecting means' first and second signals and providing a timing signal encoding the time between the start of adjacent first and second signals in a preselected half cycle of the AC wave; and

c. comparison means for comparing the difference between the time encoded in the timing signal and the time elapsed between adjacent first and second peak amplitude percentages of a sine wave of the same predetermined nominal frequency and amplitude as the AC wave, and supplying an error signal if different by more than a predetermined amount.

4,031,465
SCR, DIODE, DIAC, AND TRIAC TESTER

John Franklin Sterner, Piscataway, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,812
Int. Cl.² G01R 31/22
U.S. Cl. 324—158 SC **7 Claims**



1. A tester for thyristor semiconductor devices having two main electrodes and a control electrode, comprising,

first, second, third terminals adapted to be connected respectively to said main electrodes and said control electrode,

a power source,

means including first switch means connected between said source and one of said first and second terminals for selectively providing direct current or alternating current and for setting the voltage value of electrical energy provided from said source to said first and second terminals, conductor means connecting the power source to the other of said first and second terminals,

pulse source means,

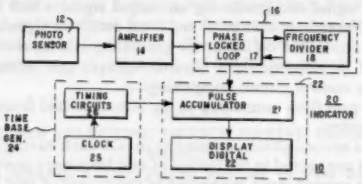
second switch means connecting said pulse source means to said third terminal for selectively (i) setting the pulse current direction and (ii) generating a trigger pulse of electrical energy to said third terminal, said selectively generated trigger pulse having a substantially instantaneous rise time and an exponential fall time based on time constant τ such that $\tau << T$, where T is the pulse period, and

indicating means connected in the path of the power source to indicate the presence of current flow between said first and second terminals according to the acceptable operating parameters of the particular device under test.

4,031,466
DIGITAL PHOTO-OPTICAL TACHOMETER

Ernest Harry Krause, Addison; Wesley Arthur Seaman, River Grove, and Peter Gregory Angelopoulos, Elmhurst, all of Ill., assignors to The Pioneer Electric and Research Corporation, Forest Park, Ill.

Filed May 5, 1975, Ser. No. 574,252
Int. Cl.² G01P 3/36; G01R 25/00
U.S. Cl. 324—175 **15 Claims**



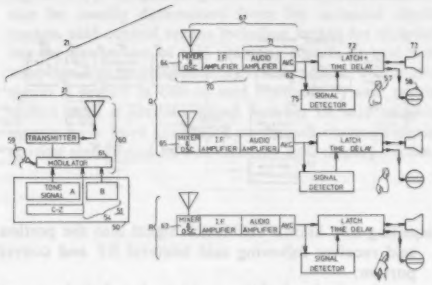
1. In a tachometer for measuring the rotational or reciprocating speed of a moving object, the combination comprising sensing means for deriving an input signal related in frequency to the speed of the object, frequency detecting means including phase comparator means for comparing said input signal with a reference signal of a predetermined frequency and for providing a series of output pulses having a frequency which is an integral multiple of the frequency of the input signal, timing means, and output means controlled by said timing means to be responsive to the number of output pulses provided within a predetermined time duration to provide an indication of the speed of said object.

4,031,467
ALERTING PROCESS AND SYSTEM OF APPARATUS THEREFOR

Lewis Singleton, Jr., 422 Ramada, Amarillo, Tex. 79108, and James M. Whitney, 3403 Paramount, Amarillo, Tex. 79109

Filed Sept. 19, 1975, Ser. No. 614,918
Int. Cl.² H04J 3/00
U.S. Cl. 325—54 **12 Claims**

8. A localized area warning process comprising, in a large geographic area, continuously operating a radio frequency transmitter at and broadcasting a fixed radio frequency signal characteristic with audio modulation and a plurality of distinct emergency modulating audio signals each of fixed frequency in range of 20 to 3,000 Hz, carried by said radio frequency signals for a predetermined time and, in one of several separate smaller geographic area portions within said one large area, at each of a plurality of radio frequency receiving circuits tuned to said fixed radio frequency signal and comprising a audio detector circuit and a loudspeaker circuit not operatively connected to said detector circuit, continuously actuating said audio detector circuit by said modulated frequency signals and an electrical power source and, in an emergency situation, selectively actuating a selective audio signal frequency receiving circuit by one of said distinct emergency modulating audio signals carried by said radio frequency signal and characteristic of that one smaller geographic area portion only, and timing said period of actuation and



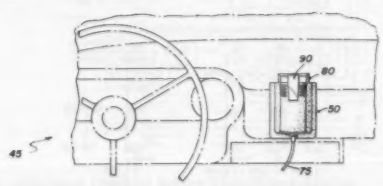
after a predetermined period of time of such actuation operatively connecting said audio detector to a loudspeaker and then maintaining operative connection therebetween for only a predetermined period of time while

an audio frequency signal is passed from said radio frequency transmitter to said loudspeakers and an audible verbal message produced by said loudspeaker.

4,031,468
RECEIVER MOUNT

Donald O. Ziebell, and James M. Longly, both of Lexington, Nebr., assignors to Reach Electronics, Inc., Lexington, Nebr.

Filed May 4, 1976, Ser. No. 682,843
Int. Cl.² H04B 1/08
U.S. Cl. 325—312 **13 Claims**



1. A mount for a portable RF receiver, said receiver having a current conducting clip constituting the receiver input for RF signals, said clip adapted to be connected to an antenna, said mount comprising a holder for said receiver, a terminal on said holder for connection to an antenna, and means on said holder electrically coupled to said terminal and placed into electrical contact with said clip when said receiver is positioned in said holder.

4,031,469
RECEIVER GAIN CALIBRATION

Edgar A. Johnson, Tujunga, Calif., assignor to The Singer Company, New York, N.Y.

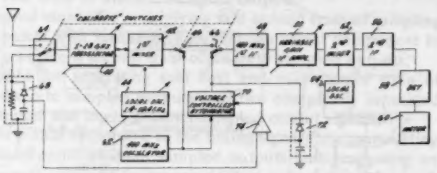
Continuation of Ser. No. 612,057, Sept. 10, 1975, abandoned. This application May 26, 1976, Ser. No. 690,345
Int. Cl.² H04B 17/00
U.S. Cl. 325—363 **6 Claims**

1. A method for gain calibrating superheterodyne receivers having a bilateral RF and converter portion at the input

thereof, and IF portion, and a detector portion near the output thereof; said method comprising the steps of:

injecting into the output of said RF and converter portion a calibration signal of known amplitude and at the RF and converter portion a calibration signal of known amplitude and at the IF frequency of said receiver;

measuring the level of said calibration signal appearing at the RF input of said receiver to determine the gain of said bilateral RF and converter portion;



injecting said known calibration signal into the portion of said receiver following said bilateral RF and converter portion;

measuring the level of the signal produced at the output of said receiver to determine the gain of said receiver portion following said RF and converter portion; and

algebraically adding said RF and converter gain with said gain of said receiver portion following said RF and converter portion to obtain the overall gain of the receiver at the frequency to which it is tuned.

4,031,470

OPERATION PROGRAM-PRESETTING SYSTEM

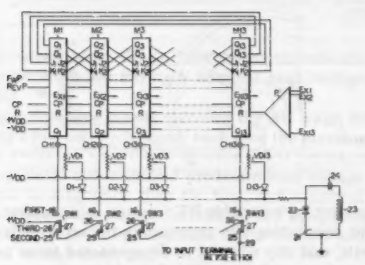
Naoyuki Kokado, Tokyo, and Shinichi Makino, Fujisawa, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1975, Ser. No. 568,204

Claims priority, application Japan, Apr. 19, 1974, 49-43465

Int. Cl.² H04B *1/16*; H01H *43/00*

U.S. Cl. 325—396 **8 Claims**



1. An operation program-presetting system comprising:

a. input means including a plurality of switches each providing both time and control data;

b. means for generating coded signals corresponding to the operation of each of said switches;

c. means responsive to the order in which said coded signals are generated for allotting said coded signals into sets of information, each set comprising both time data and control data;

d. means for storing said sets of information;

e. means for generating a time signal;

f. means for generating a coincident signal when said time signal coincides with any one of said time data in a stored set of information; and

g. means for controlling at least one external appliance responsive to both said coincident signal and said control data included in said one set of information having time data in coincidence with said time signal.

4,031,471

AUTOMATIC FREQUENCY CONTROL CIRCUIT

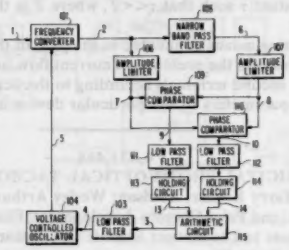
Toshitake Noguchi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1975, Ser. No. 641,709

Claims priority, application Japan, Dec. 18, 1974, 49-145156

Int. Cl.² H04B *1/16*

U.S. Cl. 325—423 **6 Claims**



1. An automatic frequency control circuit for use in a time-division multiplex communication syatem including a frequency converter for receiving an input signal and a local oscillator signal and producing an output signal which is the sum or difference of said input and local oscillator signals, and a voltage-controlled oscillator for generating said local oscillator signal in response to a control voltage, said automatic frequency control circuit comprising:

a band-pass filter connected to the output of said frequency converter,

first and second phase comparator means each having a first input connected to the output of said frequency converter and a second input connected to the output of said band-pass filter for comparing the phases of the input and output signals of said band-pass filter, said first and second phase comparator means having different output characteristics,

first and second holding circuits for holding the maximum voltages of output signals of said first and second phase comparators, respectively, and

an arithmetic circuit for calculating the average value of the output signals of said first and second holding circuits to develop said control voltage.

4,031,472

MIXER CIRCUIT

Keiro Shinkawa; Chiuichi Sodeyama, both of Yokohama; Yoichi Kaneko, Tokorozawa, and Katsuhiro Kimura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 3, 1975, Ser. No. 609,920

Claims priority, application Japan, Sept. 6, 1974, 49-102671

Int. Cl.² H04B *1/26*

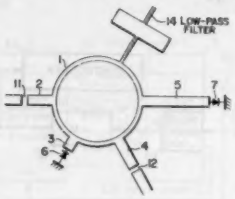
U.S. Cl. 325—446 **8 Claims**

1. A mixer circuit for converting a high frequency signal into an intermediate frequency signal comprising:

a rat-race including a first transmission line forming a circular closed loop having an overall circumferential length corresponding to three halves the wavelength of the high frequency signal, a second transmission line connected to said first transmission line and having an impedance which is $1/\sqrt{2}$ times the impedance of said first transmission line, and a third, a fourth and a fifth transmission line connected to said first transmission line in such a relationship that they are successively spaced apart from

the connection point of said second transmission in the above order along said first transmission line by an arcuate distance corresponding to one quarter the wavelength of the high frequency signal, said third, fourth and fifth transmission lines having an impedance equal to that of said second transmission line;

means for supplying said high frequency signal to be subject to the frequency conversion to one of said second and fourth transmission lines in said rat-race and supplying a local oscillation signal to the other of said second and fourth transmission lines connected to said rat-race;



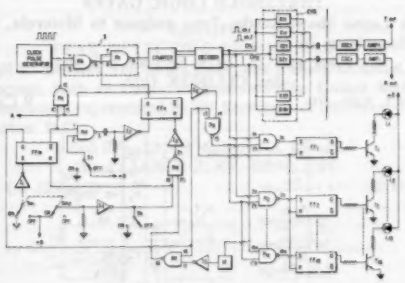
a pair of diodes grounded at one terminal thereof and connected at the other terminal thereof to the other end of said third and fifth transmission lines respectively; and

output means connected to said first transmission line at a position forming a straight line passing through the connection of one of said third and fourth transmission lines to said first transmission line relative to the center of said circular closed loop formed by said first transmission line in said rat-race being on said straight line, for delivering an output signal having a frequency component representing the frequency difference between said high frequency signal and said local oscillation signal.

4,031,473
STATION SELECTING DEVICE HAVING IMPROVED MONITOR

Kaoru Mitarai, Tokyo, Japan, assignor to Trio Electronics Incorporated, Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,860
Claims priority, application Japan, Apr. 3, 1974, 49-37642
Int. Cl.² H04B 1/06
U.S. Cl. 325—455 **5 Claims**



1. A station selecting device for use in a multi-channel communication system, said device comprising

information signal receiving means for receiving information signals over at least one of a plurality of channels;

means for generating a train of clock pulses of predetermined width and period;

sensing signal generating means responsive to said information signals for generating a sensing signal for each of said channels whenever an information signal corresponding to one of said channels is present;

scanning signal generating means responsive to said clock pulses for sequentially generating a plurlity of scanning signals respectively corresponding to the sensing signals of said plurality of channels of said information signal receiving means;

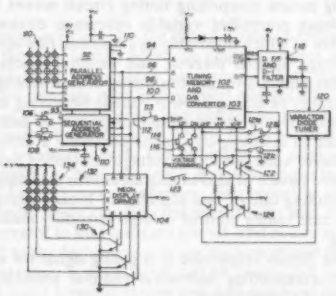
a plurality of display means respectively corresponding to said channels; and

control means responsive to said scanning signal generating means and said sensing signals for actuating those display means corresponding to the channels for which sensing signals are generated so that said last mentioned channels can be readily determined from the actuated display means, said control means including means for maintaining the generation of said scanning signals by said scanning signal generating means even though an information signal is sensed in one of said channels by said sensing means until a predetermined number of said scanning signals have been generated so that all channels having sensing signals can be displayed by said display means.

4,031,474
SOLID STATE TELEVISION CHANNEL SELECTION SYSTEM

George John Ehni, III, and Horst Leuschner, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 508,969, Sept. 25, 1974, abandoned.
This application Apr. 7, 1976, Ser. No. 674,458
Int. Cl.² H04B 1/26
U.S. Cl. 325—455 **27 Claims**



1. A television channel tuning system comprising:

switch means operable to produce a signal indicative of a desired television channel,

an address generator responsive to said signal produced by said switch means for generating a unique binary address corresponding to the desired channel,

memory means for storing a plurality of digital tuning words each representative of a different television channel and selectively outputting one of said tuning words upon reception of one of said unique binary addresses,

converter means for receiving and converting said tuning words into analog tuning levels,

manually controllable means operable to selectively change any of the digital tuning words stored in said memory means,

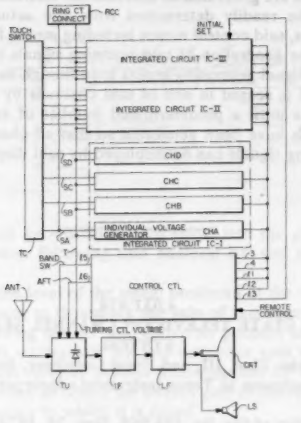
means operable in connection with said switch means to produce sequential access tuning of said system by causing said address generator to produce progressively changing binary addresses, and

skip means in said memory means for causing selective ones of the digital tuning words stored in said memory means to be skipped during sequential access tuning of said system.

4,031,475
ELECTRONIC CHANNEL SELECTING APPARATUS

Takeshi Arai, Higashiosaka, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Apr. 5, 1976, Ser. No. 673,941
Claims priority, application Japan, Apr. 3, 1975, 50-41029
Int. Cl.² H04B 1/26
U.S. Cl. 325—455 16 Claims



1. An electronic channel selecting apparatus, comprising:

means for selectively providing a plurality of individual channel selecting signals for selecting the corresponding one of a plurality of broadcasting channels,

tuning means comprising tuning circuit means including a voltage controlled variable reactance device the reactance of which is variable as a function of a tuning control voltage applied thereto, said variable reactance device determining a tuning frequency of said tuning means,

a plurality of tuning control voltage providing means, each responsive to the corresponding one of said individual channel selecting signals for providing a different tuning control voltage to said voltage controlled variable reactance device of said tuning means for selecting the corresponding one of said plurality of broadcasting channels,

each said tuning control voltage providing means comprising

gate means responsive to a gating signal for allowing the corresponding individual channel selecting signal to pass therethrough,

store means responsive to said corresponding individual channel selecting signal, as gated by said gate means, for assuming an active state and responsive to a disabling signal for assuming an inactive state,

preset voltage providing means for providing a predetermined voltage for selecting the corresponding one of said plurality of broadcasting channels when said predetermined voltage is applied to said variable reactance device, and

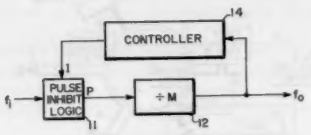
switching means responsive to the active state output from said store means for allowing said predetermined voltage to pass therethrough to said voltage controlled variable reactance device of said tuning means, said apparatus further comprising

means responsive to any one of said plurality of store means being in an active state and an individual channel selecting signal being received in any one of said plurality of tuning control voltage providing means for providing said gating and disabling signals to said gate means and store means, respectively for causing said one store means to assume an inactive state and for causing the store means of said one tuning control voltage providing means to assume an active state, whereby the broadcasting channel corresponding to said one tuning control voltage providing means is selected.

4,031,476
NON-INTEGER FREQUENCY DIVIDER HAVING CONTROLLABLE ERROR

Edwin Allen Goldberg, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 12, 1976, Ser. No. 685,549
Int. Cl.² H03K 27/00, 23/00
U.S. Cl. 328—39 4 Claims



1. A circuit, producing from a signal at a first frequency a signal at a second frequency, said first and second frequencies being related by a non-integral ratio, comprising the combination of:

gating means receptive of said first frequency signal for producing pulses in response thereto when enabled by an enabling signal;

divider means responsive to said pulses for producing said second frequency signal; and

control means responsive to said second frequency signal for enabling said gating means said control means comprising:

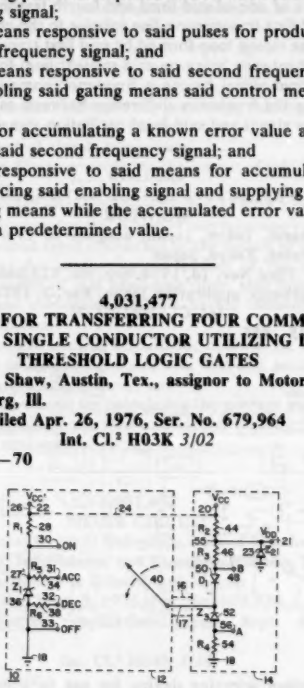
means for accumulating a known error value associated with said second frequency signal; and

means responsive to said means for accumulating for producing said enabling signal and supplying it to said gating means while the accumulated error value is less than a predetermined value.

4,031,477
SYSTEM FOR TRANSFERRING FOUR COMMANDS OVER A SINGLE CONDUCTOR UTILIZING DUAL THRESHOLD LOGIC GATES

Mark Layne Shaw, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 26, 1976, Ser. No. 679,964
Int. Cl.² H03K 3/02
U.S. Cl. 328—70 9 Claims



1. A system for transmitting a selected one of a plurality of commands along a conductor comprising:

selection means for selecting one of said plurality of commands;

transmitting means coupled to said conductor and said selection means for generating a signal on said conductor representative of said selected command;

receiving means coupled to said conductor for receiving said signal and generating a pair of ternary signals which represent said selected command;

digital means coupled to said receiving means and to a plurality of output conductors for generating a binary output signal representative of said selected command at one of said plurality of output conductors.

4,031,478

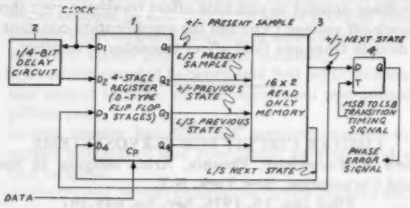
DIGITAL PHASE/FREQUENCY COMPARATOR

James Monroe Clark, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 29, 1976, Ser. No. 700,931

Int. Cl.² H03B 3/04

U.S. Cl. 328—134 **10 Claims**



1. A digital phase/frequency comparator comprising:

a first source of clock;

a second source of digital data;

first means coupled to said first and second sources to produce a first signal indicating a plus/minus phase error of a present sample of said data and a second signal indicating a large/small phase error of said present sample of said data;

second means to provide a third signal indicating a plus/minus phase error of a previous state of said data and a fourth signal indicating a large/small phase error of said previous state of said data; and

third means coupled to said first and second means responsive to said first, second, third and fourth signals following a given set of rules determined by a predetermined logic to produce a phase error signal,

said first, second and third means cooperating to provide negative frequency errors for a clockwise change of phase states of said data and positive frequency errors for counter-clockwise changes of phase states of said data.

4,031,479

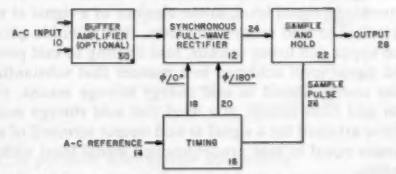
PEAK DETECTING DEMODULATOR

Virgil E. Thomas, Jr., China Lake, and Donald G. Quist, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,585

Int. Cl.² G05B 21/02; H03D 1/00

U.S. Cl. 329—50 **5 Claims**



1. A demodulator for converting varying amplitude alternating current (a.c.) signals into direct current (d.c.) format representative of the information contained therein, comprising:

first and second a.c. signals of identical frequency, wherein said first signal is the input of said demodulator containing said information and said second signal is a reference signal;

rectifying means for full-wave rectifying said input and providing an output of either all positive value pulses or all negative value pulses;

gated means for sampling and holding the value of said pulses when said gated means is gated; and

timing means coupled to said reference signal for gating said gated means at only the peak values of said pulses,

such that the value held by said gated means is the demodulator's output, which is a d.c. format representative of at least part of the information contained in said a.c. signal.

4,031,480

CIRCUIT ARRANGEMENT FOR THE UNGROUNDED TRANSMISSION OF SIGNALS THROUGH TESTING POINTS IN COMMUNICATION SYSTEMS

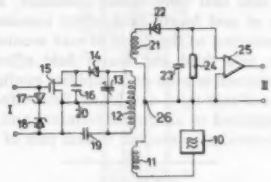
Josef Huellwegen, Altenbeken, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed Feb. 3, 1976, Ser. No. 654,759

Claims priority, application Germany, Feb. 5, 1975, 2504785

Int. Cl.² H03F 3/38

U.S. Cl. 330—10 **8 Claims**



1. In a circuit arrangement for the ungrounded transmission of signals through testing points in communication systems with the aid of high-frequency oscillations which are signal controlled on one side of a testing point and rectified on the other side of the testing point and utilized to reproduce the signals, said circuit arrangement having input terminal means and output terminal means, the improvement comprising a resonant circuit, a high-frequency generator powered independently of said circuit arrangement, first inductive coupling means for inductively coupling the output from said high-frequency generator to said resonant circuit, said resonant circuit being tuned to the high-frequency oscillations of said high-frequency generator, a modulation circuit connected between and to said input terminal means and said resonant circuit, a demodulaton circuit and second inductive coupling means for inductively coupling the input to said demodulation circuit to said resonant circuit, the output to said demodulation circuit being connected to said output terminal means.

4,031,481

TRANSISTOR AMPLIFIER

Tadao Yoshida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 16, 1975, Ser. No. 578,195

Claims priority, application Japan, May 23, 1974, 49-59292[U]

Int. Cl.² H03F 3/16

U.S. Cl. 330—35 **6 Claims**

1. A transistor amplifier comprising:

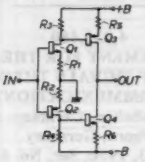
power supply means having a pair of terminals for providing operating potentials;

first and second field effect transistors each having triode-type dynamic characteristics, the gate electrodes of said first and second field effect transistors being supplied with an input signal to be amplified and the source and drain electrodes of said first and second field effect tran-

sistors being connected in a series circuit between said pair of terminals, the source electrodes of said field effect transistors being connected to each other, and said first and second field effect transistors operating as a common source class-A amplifier;

a first connection point connected to one of said source and drain electrodes of said first transistor;

a second connection point connected to one of said source and drain electrodes of said second transistor and having a different DC voltage level than said first connection point; and



third and fourth field effect transistors each having triode-type dynamic characteristics, the gate electrode of said third field effect transistor being directly connected to the drain of said first field effect transistor, and the gate electrode of said fourth field effect transistor being directly connected to the drain of said second field effect transistor, said third and fourth field effect transistors being connected in push-pull amplifier configuration, and the drains of said third and fourth field effect transistors being connected to an output terminal and having their source electrodes connected to said pair of terminals.

4,031,482

BIAS CIRCUIT FOR FET

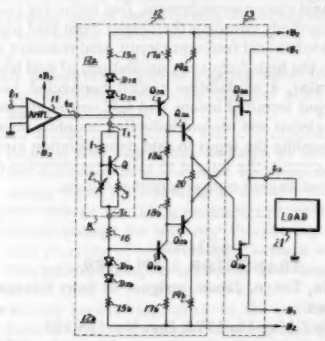
Katsuaki Tsurushima, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 10, 1975, Ser. No. 630,331

Claims priority, application Japan, Nov. 14, 1974, 49-131276; Nov. 12, 1974, 49-130125

Int. Cl.² H03F 3/16

U.S. Cl. 330—35 **12 Claims**



1. A bias circuit for use with a field effect transistor comprising: means for supplying an operating voltage susceptible to voltage fluctuations; a field effect transistor having triode-type dynamic characteristics and including gate, source and drain electrodes; means for applying said operating voltage across said drain and source electrodes through a load; input circuit means for applying an input signal to said gate electrode; bias voltage generating means for generating a bias voltage and applying same to said gate electrode of said field effect transistor, said bias voltage generating means including compensating means coupled to said operating voltage supply means and responsive to voltage fluctuations in said operating voltage to correspondingly vary said bias voltage applied to said gate electrode so as to stabilize the DC drain bias current of said field effect transistor in spite of the voltage fluctuations in the operating voltage; and voltage-controlled impedance means having a pair of terminals at least one of which being coupled to said compensating means and supplied with said operating voltage, said impedance means including biased semiconductor means connected to said pair of terminals having an impedance thereacross which varies with said operating voltage fluctuations in a hyperbolic relation that is substantially the same as the relationship between the amplification constant (μ) and the pinch off voltage (Vp) characteristics of said field effect transistor so as to adjust the DC gate bias voltage applied to said field effect transistor even though the pinch-off voltage (Vp) and the amplification constant (μ) may deviate from one field effect transistor to another.

4,031,483

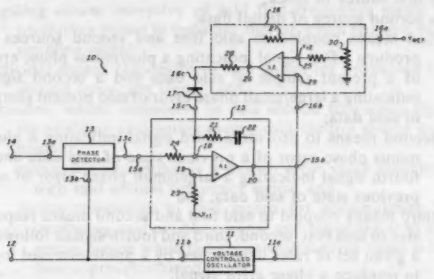
LIMITER CIRCUIT FOR SERVOSYSTEMS

Richard B. Formeister, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,307

Int. Cl.² G05B 11/06, 23/02; H03B 3/04

U.S. Cl. 331—17 **11 Claims**



1. In a servomechanism of the type including a feedback loop having an error detecting means with first and second input terminals and an output terminal, for detecting and providing at said output terminal, an error signal consistent with a signal coupled to said first input terminal from an output terminal of said servomechanism and a signal coupled to said second input terminal; means, having an input terminal coupled to said output terminal of said error detecting means and an output terminal and containing means for storing electrical energy, for providing a filtered error signal at said output terminal; and means, coupled between said second input terminal of said error detecting means and said output terminal of said filter means for providing a signal representative of said filtered error signal, the combination with said filter means of means, coupled to said filter means, for limiting said error signal at said output terminal of said filter means to a predetermined signal level, in the absence of a signal at said input terminal to said servomechanism, that is within predetermined upper and lower bounds, said limiting to said predetermined signal level achieved in a manner that substantially maintains energy stored in said energy storage means, contained in said filter means, at a level that said storage means would have attained for a signal at said output terminal of said filter means equal to said predetermined signal level without said limiting.

9. A method for observing the transient response of a servosystem containing a filter means which comprises:

coupling a limiter circuit containing a variable reference source to said filter means;

adjusting said reference source to establish a reference signal at said limiter circuit, said reference signal establishing a level to which the output signal of said filter

means is servoed, in the absence of an input signal within a predetermined frequency range to said servosystem, such that energy storage devices contained within said filter means exhibit an energy storage that is consistent with said output signal of said filter means;

applying an input signal to said servosystem; and

observing the output signal of said servosystem from the time said input signal is applied to the time marking the completion of said transient.

10. A limiter, in combination with a filter means having an input and an output terminal and containing a storage element therein, comprising:

means for receiving a reference signal;

a differential operational amplifier having a first input terminal coupled to said reference signal receiver means, a second input terminal coupled to said output terminal of said filter means and an output terminal;

a first resistor coupled between said first input terminal and said output terminal of said differential operational amplifier; and

a second resistor having a first terminal coupled to said output terminal of said operational amplifier and a second terminal;

a unidirectional current conductive device coupled between said second terminal of said second resistor and said filter means and poled to be operative when a signal at said input terminal of said filter means exceeds a specified value so that a signal at said output terminal of said operational amplifier servoes to a predetermined level thereby accomplishing said limiting in a manner that maintains a charge on said storage element at a value consistent with said predetermined signal level.

4,031,484

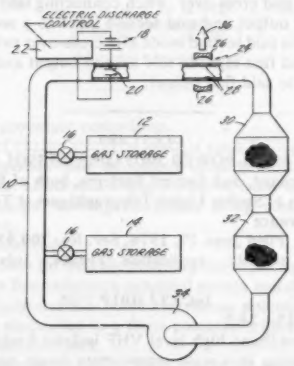
PORTABLE CHEMICAL LASER WITH GAS RECIRCULATION

Robert J. Freiberg, South Windsor; David W. Fradin, Manchester; Peter P. Chenausky, West Hartford, and Frank R. Biancardi, South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 11, 1975, Ser. No. 630,828

Int. Cl.² H01S 3/00

U.S. Cl. 331—94.5 G **14 Claims**



1. A portable laser system comprising:

a closed loop circuit through which a gaseous medium may be repeatedly circulated;

a vessel for the containment of a first gas and a second gas, said vessel being connected to the conduit in a manner which allows these gases to be controllably admitted into the conduit;

means for causing dissociation of the first gas in the conduit to form a species of atomic gas, such means being downstream of the position at which the first and second gases are admitted into the conduit;

a reaction region in which the atomic gas and the second gas combine chemically to form an excited species from which laser radiation can be extracted;

optical means adjacent to the reaction region for extracting laser radiation from the active species;

scrubber means for removing undesired constituents in the gaseous working medium passed therethrough, the scrubber being positioned in the conduit downstream of the optical means; and

recirculation means for continuously pumping the working medium around the fluid circuit described by the conduit.

4,031,485

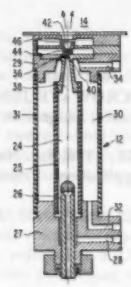
METHOD FOR ACHIEVING GAS DYNAMIC LASING

Robert Anthony Crane, Beaconsfield, and Asoke Kumar Ghosh, Dollard des Ormeaux, both of Canada, assignors to RCA Corporation, New York, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,005

Int. Cl.² H01S 3/095, 3/22

U.S. Cl. 331—94.5 P **10 Claims**



1. A method for achieving dynamic laser emission comprising:

dissociating molecules of a multi-atomic molecular first gas into atoms;

recombining the dissociated atoms into molecules in a metastable energy state;

mixing a second gas with the recombined molecules to form an active laser gas mixture having a population inversion; and

injecting the gas mixture into an optical laser cavity.

4,031,486

MEDIUM Q HIGH POWER DUAL CAVITY OSCILLATOR

Richard Calvin Havens, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumberg, Ill.

Filed May 26, 1976, Ser. No. 690,215

Int. Cl.² H03B 9/12

U.S. Cl. 331—96 **4 Claims**

1. A microwave oscillator comprising:

a first resonator:

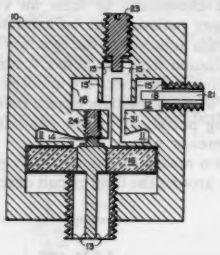
a second resonator electromagnetically coupled to the first resonator;

negative resistance means electromagnetically coupled to the first resonator;

means for supplying energy to said negative resistance means to provide RF energy;

means for coupling the output of the second resonator electromagnetically to a load wherein said first and said second resonators form a circuit with the characteristics of a parallel resonant circuit at a first frequency and wherein said negative resistance means and said first and

second resonators form a circuit with the characteristics of a series resonant circuit when the oscillator is operated



at a second frequency which is within 20% below said first frequency.

4,031,487

RECIPROCAL MICROWAVE JUNCTION DEVICE

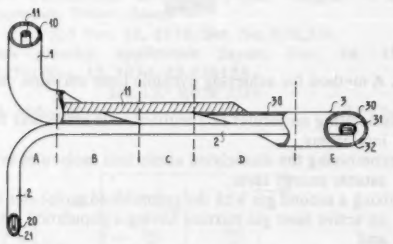
Jean Rannou, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 28, 1976, Ser. No. 653,022

Claims priority, application France, Jan. 31, 1975, 75.03101

Int. Cl.² H01P *5/00, 3/06*

U.S. Cl. 333—1 **4 Claims**



1. A reciprocal microwave junction device between a system of concentric coaxial lines having an external conductor and an internal coaxial line, and a first and a second independent coaxial line each having an internal conductor and an external conductor, said junction device comprising:

a section of two parallel wires transmission line having a first wire formed of a common section of the first independent coaxial line and the internal coaxial line of the concentric coaxial line system, and a second wire formed of an extension of the internal conductor of the second independent coaxial line,

said first and second coaxial line being located adjoining and parallel to one another at one end of said device, the external conductor of said second independent coaxial line terminating at said end and making electrical contact with said first line external conductor,

said concentric coaxial line system being located at the other end of said device in prolongation of the first coaxial line, the external conductor of said concentric coaxial line system terminating at said other end and making electrical contact with said second line internal conductor.

4,031,488

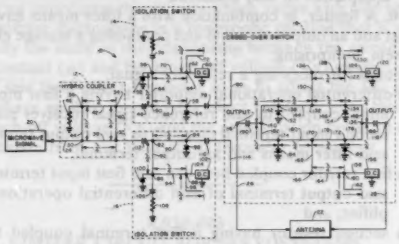
MULTIPLE POLARIZATION SWITCH

Lawrence A. Beno, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 5, 1976, Ser. No. 673,557

Int. Cl.² H01P *1/16, 1/15, 1/18*

U.S. Cl. 333—21 A **45 Claims**



1. A multiple polarization switch for providing horizontal, vertical, right-hand circular and left-hand circular polarization from a single microwave source comprising:

a. a hybrid coupler having an input coupled to receive a microwave signal from a microwave source and a first and second output having first and second respective signals appearing thereon, said first signal being substantially 90° out of phase with said second signal;

b. a first isolation switch connected to receive said first signal from said hybrid coupler first output at an input port, said first switch passing said first signal to an output port when on and terminating the passage of said first signal to said output port when off;

c. a second isolation switch connected to receive said second signal from said hybrid coupler second output, said second switch passing said second signal to an output when on and terminating the passage of said second signal to said output port when off;

d. a cross-over switch having first and second input ports connected, respectively, to receive said first

and second signals from said first isolation switch output and said second isolation switch output, said cross-over switch having a first and second mode, when in said first mode said cross-over switch connecting said first input to a first output and said second input to a second output, when in said second mode said cross-over switch connecting said first input to said second output and said second input to said first output.

4,031,489

VHF HIGH-POWER BROADBAND ISOLATORS

Nicolle Bernard, and Gerard Forterre, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed June 29, 1976, Ser. No. 700,916

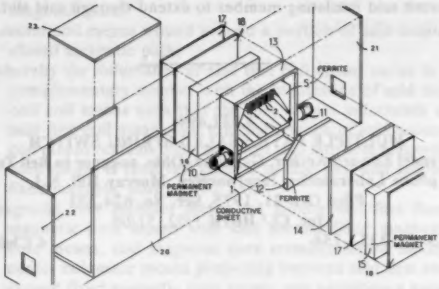
Claims priority, application France, July 15, 1975, 75.22036

Int. Cl.² H01P *1/36*

U.S. Cl. 333—24.2 **6 Claims**

1. A broadband high level VHF isolator having two terminals operating in a wide temperature range comprising two gyromagnetic material slabs on both sides of a substantially trapezoidal metal sheet connected respectively to the two terminals, radiating slots defining teeth cut from said sheet along at least one edge parallel to the propagation direction, the distance between the bottom of said teeth and the nearest edge of gyromagnetic slabs material equal to a quarter wavelength within the gyromagnetic material at a frequency in the operating frequency band, means to encase said slab, means to establish a non uniform d.c. magnetic field within said slabs reaching the gyromagnetic valve in the vicinity of said teeth

and of lower value elsewhere, means to compensate for the variations of permeability of the gyromagnetic material and



the d.c. establishing means with temperature, and means to close the d.c. magnetic field.

4,031,490

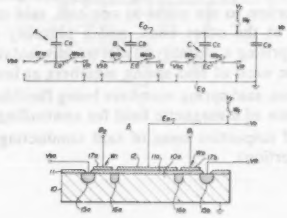
ANALOG SIGNAL PROCESSOR

Miles Alexander Copeland, Ottawa, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Jan. 29, 1976, Ser. No. 653,293

Int. Cl.² H03H *7/28;* **G06G** *7/19;* **H01L** *29/78, 29/50*

U.S. Cl. 333—70 T **3 Claims**



1. A signal processor comprising:

a plurality of charge storage elements each having an input signal electrode and an output sensing electrode, the input signal electrodes being separated from each other and the output sensing electrodes being connected to each other;

a common electrode;

a control means for initially coupling the input signal electrodes to a first reference potential source and the output sensing electrodes to a second reference potential source to set the electrodes to a fixed potential with respect to the common electrode;

the control means thereafter disconnects the second reference potential source from the output sensing electrodes, selectively disconnects the first reference potential source from preselected input signal electrodes, and connects sampled analog signal potential sources to said preselected input signal electrodes to alter the voltage on the storage elements so as to derive an output signal voltage on the output sensing electrodes which is a function of the magnitude of the sampled analog signal potentials and of the preselected connections of the sources to the input signal electrodes.

4,031,491

TUNING APPARATUS USING A VOLTAGE-DEPENDENT REACTANCE ELEMENT

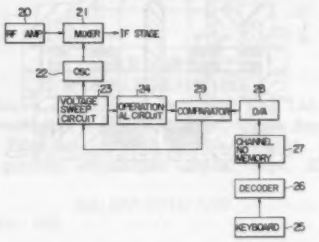
Yoichi Sakamoto, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 20, 1975, Ser. No. 551,383

Claims priority, application Japan, Feb. 25, 1974, 49-22636; Feb. 25, 1974, 49-22637; Mar. 4, 1974, 49-25448

Int. Cl.² H03H *5/12;* **H03J** *3/06, 5/04*

U.S. Cl. 334—15 **9 Claims**



1. A tuning apparatus comprising:

a tuning circuit including means for generating tuning frequencies having a voltage dependent reactance element as a tuning element;

a voltage sweep circuit coupled to said tuning circuit for producing a D.C. sweep tuning voltage, said D.C. sweep tuning voltage being applied to said voltage dependent reactance element to control the generation of said tuning frequencies;

an operational circuit including a logarithm converter circuit coupled to said voltage sweep circuit for converting said D.C. tuning voltage to a D.C. reference voltage which varies in linear proportion to said tuning frequencies;

a standard voltage generating circuit for selectively producing a D.C. standard voltage;

voltage comparator means coupled to said operational circuit for comparing said D.C. reference voltage with said D.C. standard voltage; and

means coupling said comparator means to said voltage sweep circuit for controlling the sweep of said voltage sweep circuit in response to the output of said comparator means to produce a predetermined tuning frequency in said tuning circuit.

4,031,492

TRIPLE BREAK CURRENT LIMITER

John A. Wafer, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 22, 1975, Ser. No. 607,005

Int. Cl.² H01H *77/10*

U.S. Cl. 335—16 **8 Claims**

1. A current limiting circuit interrupter comprising:

a first stationary contact;

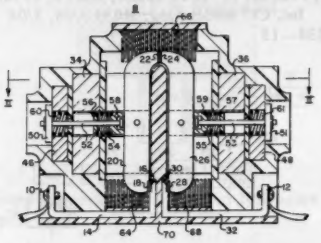
a second stationary contact;

a first elongated bridging member having a first movable contact and a second movable contact disposed in a spaced apart relationship thereon;

a second elongated bridging member having a third movable contact and a fourth movable contact disposed in a spaced apart relationship thereon; and,

operating means associated with said first elongated bridging member and said second elongated bridging member for moving said first elongated bridging member and said second elongated bridging member in opposite directions from a closed position wherein said first movable contact engages said first stationary contact, said second movable contact engages said third movable contact and said

fourth movable contact engages said second stationary contact to an open position wherein said first movable contact is spaced apart from said first stationary contact,



said second movable contact is spaced apart from said third movable contact and said fourth movable contact is spaced apart from said second stationary contact.

4,031,493

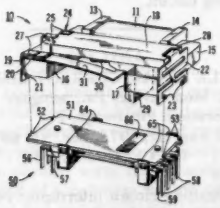
MINIATURE LOW PROFILE RELAY

Michael Principe Van Der Wielen, Reynoldsburg, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 12, 1975, Ser. No. 640,019

Int. Cl.² H01H *67/02*

U.S. Cl. 335—128 **12 Claims**



1. A low profile relay having a magnetic circuit subassembly and a distinct contact spring subassembly, said magnetic circuit subassembly comprising a substantially U-shaped core to present a base and a pair of legs, said core having a winding at said base, a flat armature member hinged at one end thereof to one surface of one of the legs of said core, an actuating insulated member mounted on said armature member adjacent the other leg of said core, and a flat return spring member held at one between said one leg of said core and said one end of said armature member and having its other end bearing against said actuating insulating member; said contact spring subassembly comprising a flat nonmagnetic support plate having a slot therein and a plurality of contact springs mounted on one side thereof, the other side of said support plate being affixed to the other surfaces of said legs of said core in a manner to permit said insulating member to extend through said slot.

4,031,494

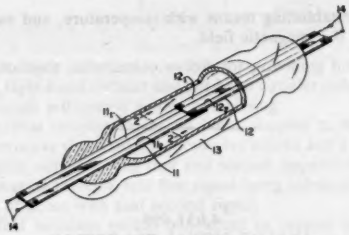
MULTIPLE PATH SEALED SPRING SWITCH

Wendel Edward Archer, Gahanna, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 21, 1975, Ser. No. 624,333

Int. Cl.² H01H *1/02, 51/06*

U.S. Cl. 335—154 **4 Claims**



1. An electrical switch structure comprising a pair of magnetically responsive flat spring members arranged to present opposing faces and each being further arranged to present an overlap portion to the other at one end, said members being supported at the other ends, and a plurality of conducting paths comprising a plurality of electrically isolated conductive coatings on each of said spring members at least on said opposing faces, said spring members being flexible responsive to the presence of a magnetic field for controlling the electrical contact of respective ones of said conducting paths at said overlap portions.

4,031,495

Patent Not Issued For This Number

4,031,496

VARIABLE INDUCTOR

Hideo Fujiwara, Tachikawa; Yukio Ichinose, Kokubunji; Satoshi Taniguchi, Tokorozawa; Tsutomu Kobayashi; Kazuo Ichino, both of Tokyo; Michiyasu Itoh, Kodaira; Yasutaro Uesaka, Hachioji; Fumiyuki Inose, Kokubuaji, and Sadayasu Ueno, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 3, 1974, Ser. No. 485,626

Claims priority, application Japan, July 6, 1973, 48-76808; July 6, 1973, 48-76809; July 6, 1973, 48-76811

Int. Cl.² H01F *21/06*

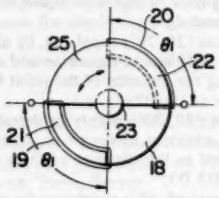
U.S. Cl. 336—135 **11 Claims**

1. A variable inductor comprising

movable magnetic core means;

first fixed magnetic core means forming with said movable magnetic core means a first closed magnetic path;

second fixed magnetic core means forming with said movable magnetic core means a second closed magnetic path;
first coil means wound around a portion of said first closed magnetic path;
second coil means wound around a portion of said second closed magnetic path;
whereby the inductance of said first coil means varies in a complementary manner with the inductance of said second coil means such that the sum of said inductance of said first coil means and said inductance of said second coil means remains constant when said movable magnetic core means is removed relative to said first and second fixed magnetic core means, and
magnetic core member means for joining said first fixed magnetic core means with said second fixed magnetic core means, said magnetic core member means having center columnar means projecting between said first and second fixed magnetic core means and providing a common magnetic path portion of said first and second closed magnetic paths,
said movable magnetic core means being rotatably supported relative to said first and second fixed magnetic core means joined by said magnetic core member means



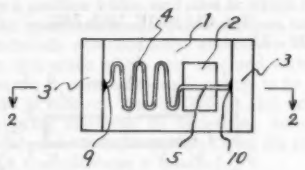
about the longitudinal axis of said columnar means opposite parallel surfaces of said first and second fixed magnetic core means, and said movable magnetic core means being supported with respective constant gap portions from said opposite parallel surfaces of said first and second fixed magnetic core means,
wherein as said movable magnetic core means is rotated about said longitudinal axis of said columnar means, the sum of the areas of the surfaces of said first and second fixed magnetic core means which face said movable magnetic core means remains constant and wherein said movable magnetic core means is magnetically coupled more closely at said center columnar means than at said gap portions;
wherein said magnetic core member means is disc-shaped, said first and second fixed magnetic core means are of arcuate shape and project axially of said magnetic core member means at respective edge portions thereof toward said movable magnetic core means and said movable magnetic core means is rotatably mounted parallel to said magnetic core member means; and
wherein said movable magnetic core means comprises
a substantially semi-circular shaped disc piece parallel to said magnetic core member means,
wherein the longitudinal axes of said magnetic core member means and said columnar means coincide with the axis of rotation of said movable magnetic core means.

4,031,497

FUSIBLE RESISTOR

Juichiro Ozawa, c/o Susumu Industrial Co., Ltd. No. 14, Umamawashi-cho, Kamitoba, Minami, Kyoto, Japan

Filed Jan. 13, 1976, Ser. No. 648,804
Claims priority, application Japan, Sept. 23, 1975, 50-115411
Int. Cl.² H01C 7/00
U.S. Cl. 338—308 **2 Claims**



1. A fusible resistor device comprising a base plate of a heat resistant material, a thin layer of an organic material which is caused to decay when heated and over at least a part of said base plate, and an elongated film of a fusible resistor material extending across said base plate, at least a part of said film lying on said layer of organic material, whereby when the resistor film is connected in a circuit and an excessive current flows through said film of resistor material in the case of a somewhat excess current the heat generated thereby melts the organic film and the resistor film is no longer supported and ruptures, thereby opening the circuit in which the resistor film is connected.

4,031,498

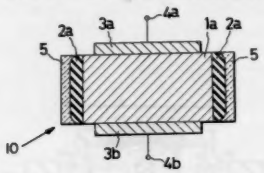
NON-LINEAR VOLTAGE-DEPENDENT RESISTOR

Masahiro Hayashi; Masanori Haba; Misuzu Watanabe, and Shinji Hirano, all of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Oct. 24, 1975, Ser. No. 625,515
Claims priority, application Japan, Oct. 26, 1974, 49-123730; Oct. 16, 1975, 50-124603
Int. Cl.² H01C 7/10
U.S. Cl. 338—21 **23 Claims**

1. A non-linear voltage-dependent resistor comprising a non-linear resistance element having a good non-linearity and a high dielectric constant, and an inorganic electrically insulating coating formed on said resistance element, obtained by firing together at a temperature of from 1,000° to 1,400° C a formed element including zinc oxide (ZnO) and a coating

material applied on the formed element, said coating material including a mixture of zinc oxide (ZnO), silicon dioxide



(SiO_2), bismuth trioxide (Bi_2O_3) and antimony trioxide (Sb_2O_3).

4,031,499

THERMISTOR DEVICE

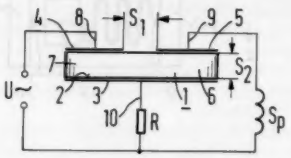
Wolfgang Brueckner, Deutschlandsberg, Austria, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 30, 1975, Ser. No. 591,890

Claims priority, application Germany, July 9, 1974, 2433000

Int. Cl.² H01C 7/00, 7/02

U.S. Cl. 338—23 **7 Claims**



1. A thermistor device comprising:

a PTC thermistor body having first and second surfaces and a given body thickness therebetween,

a continuous conductive layer on said first surface of said thermistor body,

two conductive layers on the said second surface of said thermistor body and spaced from said continuous layer by said given thickness,

each of said two conductive layers being spaced apart on said second surface by a predetermined interval,

said predetermined interval being substantially the same as said given body thickness, and

said thermistor having three terminals, one for each of said conductive layers.

4,031,500

POSITION MEASURING DEVICE

Guy Parent, Le Plessis-Robinson, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel SA, Paris, France

Filed Feb. 11, 1976, Ser. No. 657,330

Claims priority, application France, Feb. 27, 1975, 75.06083

Int. Cl.² G01S 5/18

U.S. Cl. 340—6 R **11 Claims**

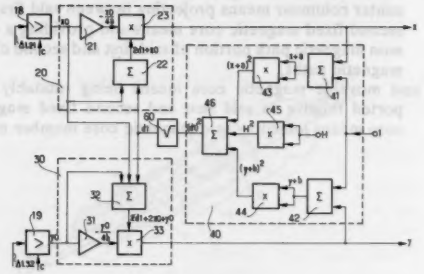
1. In a position measuring device, making it possible to calculate the position of a vessel which can move on water in relation to a fixed point O situated on the sea bed from which are emitted sound waves, and comprising: at least three detectors D1, D2, D3 fixed to the bottom of the vessel and arranged at the apexes of a right-angled triangle, the distance between the detectors D1, D2 being $2a$, the distance between the detectors D2, D3 being $2b$, the distance between the point O and the detector D1 being d_1, the distance between the point O and the detector D2 being d_2, the distance between the point O and the detector D3 being d_3;

Means for calculating the depth H of the water below the vessel;

Means for calculating the difference in travel time Δt_{21} of the sound waves between O and D2 on the one hand and O and D1 on the other hand;

Means for calculating the difference in travel time Δt_{32} of the sound waves between O and D3 on the one hand and O and D2 on the other hand; the improvement comprising:

First means (18, 19) supplying, from the difference in travel time Δt_{21}, by multiplication by a coefficient depending on the propagation speed c of sound waves in water, a signal xo equal to the difference between d_2 and d_1 and, from the



difference in travel, by multiplication by a coefficient depending on c, a signal yo equal to the difference between d_3 and d_2;

Second means (20, 20') supplying, by algebraic multiplications and additions of signals xo and d_1, a signal equal to kx, x being the distance of the point O in relation to the mid plane of D1 D2;

Third means (30, 30') supplying, by algebraic multiplications and additions of signals xo, yo and d_1, a signal ky, y being equal to the distance of O in relation to the mid plane of D2 D3;

Fourth means (40, 40') supplying, by algebraic multiplications and additions of signals kx, ky and H, a signal equal to $k^2d_1^2$ which, after application to a square root extractor (60, 60'), is applied to the second and third means (20, 20') (30, 30').

4,031,501

APPARATUS FOR ELECTRONICALLY LOCATING ANALOG SIGNALS

Frank Caruso, W. Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 546,957, Feb. 4, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,321

Int. Cl.² G01S 3/80

U.S. Cl. 340—6 R **7 Claims**

1. Apparatus for electronically locating the source of an acoustic or seismic planar wave comprising:

a plurality of signal transducers physically positioned in a predetermined array for detecting an analog acoustic or seismic planar wave and producing an analog electrical signal indicative of said wave;

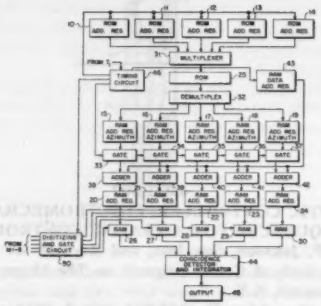
transducer sampling means electrically coupled to each signal transducer for sampling the detected analog signal at a first sampling rate consistent with the dimensions of the array and the frequency characteristic of the analog signal;

digitizing means, electrically coupled to the output of the transducer sampling means for digitizing each analog electrical signal;

a first plurality of memory means electrically coupled to

said digitizing means for storing the digitized signals associated with each transducer in real time;

programmed sampling means electrically coupled to the first plurality of memory means for repeatedly, selectively sampling the partial contents of each of the first plurality of memory means at a second sampling rate in predetermined patterns, each sample pattern corresponding to the expected positions of the digitized signals in the plurality



of memory means for a known azimuth position of the source of said planar wave; detection and summation means electrically coupled to the output of the first plurality of memory means for detecting the sampled contents of each of the first plurality of memory means and selectively summing the sampled contents so as to discount the effects of random noise;

output means coupled to the output of the detection and summation means for displaying the summations.

4,031,502

HYDROPHONE WITH ACOUSTIC REFLECTOR

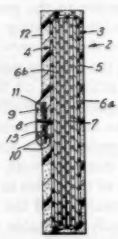
Francois L. M. Lefaudeux, Le Relecq-Kerhoun, and Michel Georges Quivy, Six Fours Les Plages, both of France, assignors to Etat Francais, Paris, France

Filed Apr. 7, 1976, Ser. No. 674,605

Claims priority, application France, Apr. 11, 1975, 75.11305

Int. Cl.² H04B *13/00*

U.S. Cl. 340—10 **6 Claims**



1. A hydrophone comprising an acoustical reflector, at least one transducer disposed adjacent said reflector, and a common envelope for said transducer and reflector;

said reflector comprising a flexible sealed container, two rigid parallel plates disposed in said container and sheets of interlaced filaments disposed between said plates,

said transducer being a piezoelectric transducer comprising a thin flexible blade in the form of a disc, at least one piezoelectric disc fixed to a surface of said blade, and a rigid annular ring to which said blade is fixed at the periphery thereof,

said reflector and transducer being entirely embedded in said common envelope with said flexible blade in immediate proximity to said reflector.

4,031,503

ANTI-CORROSION ULTRASONIC TRANSDUCER

Hiroshi Minami, Kawasaki, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Aug. 19, 1975, Ser. No. 605,808

Claims priority, application Japan, Aug. 30, 1974, 49-105078

Int. Cl.² G01V *1/00*

U.S. Cl. 340—11 **4 Claims**

1. An ultrasonic transducer comprising:

A. a cylindrical case provided at one end with an opening;

B. an ultrasonic unit disposed within said case, said unit consisting essentially of a disc-shaped electrostriction element having an inherent resonance frequency, and a relatively thick rigid body affixed thereto which reduces the natural frequency of the element to a degree axially shifting the vibratory nodal point thereof into said body, means suspending said unit from said nodal point to occupy a position within said case in which it is spaced from the inner surface of the case and from said opening;

C. an electrically non-conductive elastomeric material filling the free-space within said case and embedding the unit therein to permit ultrasonic energy to be emitted by said unit or received thereby through said opening, said energy being conveyed by said filling material which otherwise serves to isolate said unit from the environment in which the transducer is installed.

4,031,504

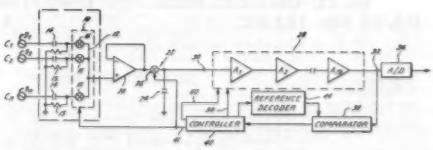
GAIN RANGING AMPLIFIER SYSTEM

George T. Mioduski, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Mar. 8, 1976, Ser. No. 664,616

Int. Cl.² G01V *1/24*

U.S. Cl. 340—15.5 GC **13 Claims**



12. A gain ranging amplifier system having input and output terminals comprising:

a plurality of amplifiers having inputs and outputs connected in cascade between said terminals, each said amplifier having at least two different gain states, one gain state being unity, the amplification ratio between said gain states being unique to each said amplifier;

controller means for defining the gain states of said amplifiers;

voltage reference means for selectively providing discrete reference voltages corresponding to the amplification ratios unique to each said amplifier, the amplifier having the highest amplification ratio being associated with the lowest reference voltage;

means for comparing the signal voltage at the output of said system with said first reference voltage; and

means for transmitting the result of the comparison to the controller.

4,031,505
SEISMIC SYSTEM WITH SIGNAL-TO-NOISE DETERMINATION

Gary D. Owens, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 24, 1976, Ser. No. 669,774
Int. Cl.² G01V 1/28
U.S. Cl. 340—15.5 DP 10 Claims

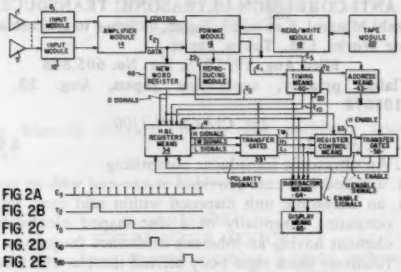


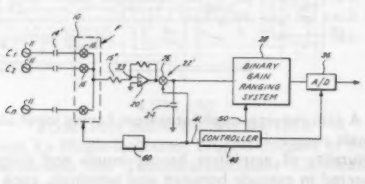
FIG. 2A
FIG. 2B
FIG. 2C
FIG. 2D
FIG. 2E

1. An improvement to a seismic system, which provides a data word having digital signals corresponding to sensed vibrations in an earth formation or to noise occurring in the seismic system, for determining the signal-to-noise ratio of the seismic system when the digital signals correspond to the noise, the data word digital signals including a sign bit corresponding to a positive or a negative polarity of the data word while the remaining data word digital signals correspond to the absolute value of the sensed vibrations or the noise, said improvement comprising sampling means connected to the seismic system for periodically sampling the data word provided by the seismic system to provide a new word for each sampling; means connected to the sampling means for storing the most positive new word, with respect to the new words provided by the sampling means, as an H word, and the most negative new word, with respect to the new words provided by the sampling means, as an L word; and means connected to the storing means for providing a digital output corresponding to the absolute difference between the H word and the L word.

4,031,506
MULTIPLEXER COMMUTATED HIGH PASS FILTER

Lee E. Siems, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Mar. 8, 1976, Ser. No. 664,614
Int. Cl.² G01V 1/22; H03K 17/56; H04Q 11/04
U.S. Cl. 340—15.5 GC 7 Claims



1. A multiplexer commutated high pass filter having a plurality of analog input terminals and an output terminal comprising:

a multiplexer having a plurality of input terminals and a common output bus;

a capacitor connected between each analog input terminal to the filter and the corresponding input terminals of the multiplexer;

a resistor connected to said common output bus;

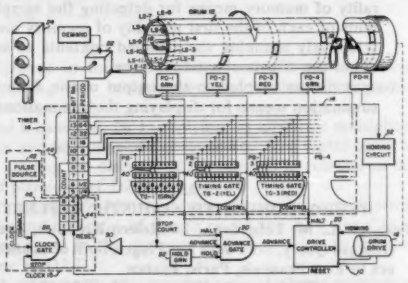
seismic sensor units connected respectively to said input terminals; and

control means connected to said multiplexer for sequentially connecting each capacitor to said resistor, said control means including means for varying the ratio of the dwell with respect to the channel-off time of said multiplexer to vary the cut-off frequency, where the dwell is the time period during which one of said seismic sensor units is connected to said resistor and the remainder of the time required to complete a scan cycle is the channel-off time.

4,031,507
TRAFFIC CONTROLLER, ELECTROMECHANICAL SEQUENCER FOR A TRAFFIC CONTROLLER

Ronald P. Johnson, San Jose, and Reynold W. Bell, Santa Clara, both of Calif., assignors to The Singer Company, Binghamton, N.Y.

Continuation of Ser. No. 485,074, July 2, 1974, abandoned.
This application Aug. 2, 1976, Ser. No. 711,013
Int. Cl.² G08G 1/00
U.S. Cl. 340—41 R 15 Claims



1. A traffic controller sequencer for establishing the order and duration of traffic light events in a traffic light cycle, the sequencer comprising:

a sequence means having prepositioned structures thereon corresponding to the traffic light events;

reading means responsive to the prepositioned structures;

drive means for providing relative motion and periods of nonmotion between the sequence means and the reading means,, permitting the reading means to sequentially read the prepositioned structures on the sequence means for establishing the sequence of traffic light events;

binary counter means having a sequential series of stages, each of which is periodically activated on a time base which doubles in duration with each subsequent stage causing each stage of the series to have a time base which is a power of two multiple of the first stage of the series;

a plurality of separately adjustable timer means, one associated with each traffic light event for independently establishing the length of the period of nonmotion for that traffic light event, each timer means having a series of inputs corresponding to at least some stages in sequence in the series of sequential stages, selected stages of the series of sequential stages being electrically connected to the corresponding input in the series of timer inputs for each timer means for establishing the period of nonmotion for that timer means which is equal to the sum of the time bases of the selected stages; and

drive controller means responsive to the plurality of timer means for initiating the relative motion, and responsive to the reading means for terminating the relative motion when a prepositioned structure is read.

4,031,508
PUNCTURE ALARM DEVICE FOR A TIRE

Seita Omori, 1109-6 Oaza Sho, Tadotsu-cho, Nakatado, Kagawa, Japan

Filed Dec. 15, 1975, Ser. No. 640,436
Int. Cl.² B60C *23/00*
U.S. Cl. 340—58 8 Claims

1. In a puncture alarm for a tire, including sensor means disposed within said tire, said sensor means for providing a change in electrical characteristic in response to the puncturing of said tire by a conductive object, and including an alarm and detection circuit means for producing an output signal in response to said sensor means to activate said alarm, said detection circuit means coupled to said sensor means and alarm, and comprising:

a power supply;

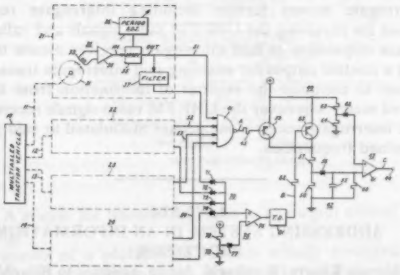
gate means coupled to said alarm for producing said output signal; and

compensation means coupled to said power supply, sensor means and gate means for biasing said gate means such that said output signal is produced only when said electrical caracteristic assumes a value outside of a preselected range, said compensation means for allowing a predetermined magnitude of degradation of said electrical characteristic without causing a false alarm.

4,031,509
LOCKED AXLE DETECTOR FOR A MULTI-AXLED TRACTION VEHICLE

E. S. Matulevich, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed June 27, 1975, Ser. No. 590,982
Int. Cl.² G08B *21/00*; B60T *8/04*
U.S. Cl. 340—62 6 Claims



1. For detecting a predetermined speed differential among a plurality of axles of a traction vehicle equipped with speed detectors that provide a corresponding plurality of input signals indicative of the speeds at which the respective axles are rotating, the improvement comprising:

a. a corresponding plurality of signal conditioning means adapted to receive said input signals from said speed detectors, each of said signal conditioning means being operative to generate a train of discrete output pulses having an average value representative of the axle speed indicated by the associated input signal as that speed varies between nearly zero and a predetermined magnitude, and each of said signal conditioning means also including an electric filter energized in accordance with the corresponding output pulse train whose average value determines the magnitude of an analog output signal of said electric filter;

b. control means coupled to said signal conditioning means and supplied with the output pulse trains respectively generated thereby, said control means being operative to produce a predetermined control signal in response to any one of said pulse trains having an average value indicating that the rotational speed of the associated axle is lower than a predetermined first threshold level, and

c. disabling means comprising:

i. an OR logic circuit coupled to the said signal conditioning means for receiving the respective analog output signals therefrom, and

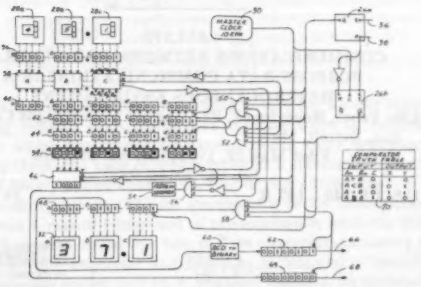
ii. level detecting means connected between said control means and said OR logic circuit for preventing the production of said control signal except when at least one of said analog signals exceeds a magnitude corresponding to a predetermined second threshold level of rotational speed of the associated axle, said second threshold level being higher than said first threshold level,

whereby the production of said control signal indicates that the speed of at least one axle is lower than said first threshold level while the speed of another axle is higher than said second threshold level, said predetermined magnitude of axle speed being at least as high as said second threshold level.

4,031,510
SPEED DETECTION SYSTEM FOR AUTOMOBILES AND OTHER MOTOR-DRIVEN OBJECTS

Frederick N. King, 5068 Franklin Ave., Los Angeles, Calif. 90027

Filed Dec. 19, 1975, Ser. No. 642,332
Int. Cl.² B60Q *1/54*
U.S. Cl. 340—62 11 Claims



1. An adjustable speed detection system for accurately recording the speed of moving objects between a pair of detection locations comprising:

start timing sensor at the first detection location of said two locations responsive to an object for commencing a time interval;

stop timing sensor at the second detection location of said two locations responsive to said object for terminating said time interval;

speed calculation means coupled to said sensors and responsive to said time interval to determine speed of said object;

compensation means included in said speed calculation means to adjust said uncompensated calculated object

speed for inaccuracies due to reaction time of said sensors; and

a decimal display matrix coupled to said speed calculation means for visually indicating said object speed.

4,031,511

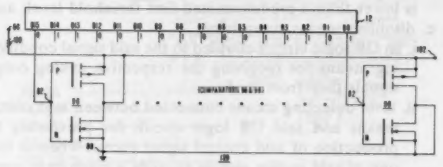
CMOS COMPARATOR

James S. Britton, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 27, 1976, Ser. No. 680,655

Int. Cl.² G06F 7/04; H03K 5/20

U.S. Cl. 340—146.2 **14 Claims**



1. A single bit comparator for comparing a variable word with a fixed word, comprising:

a pair of complementary MOS devices including a p-channel MOS and an n-channel MOS having their gates connected in common and their drains connected in common,

said drains being connected to the source of a selected one of the MOS devices, with the selected MOS device being responsive to the logic level of the fixed word,

a power supply having first and second terminals,

a load resistor,

the source of said p-channel MOS being connected to the first terminal of said power supply via said load resistor,

the source of said n-channel device being connected to the second terminal of said power supply,

an input terminal for receiving the variable word, said input terminal being connected to said gates, and

an output terminal for indicating when the variable word is equal to the fixed word, said output terminal being connected to the source of said p-channel MOS device.

4,031,512

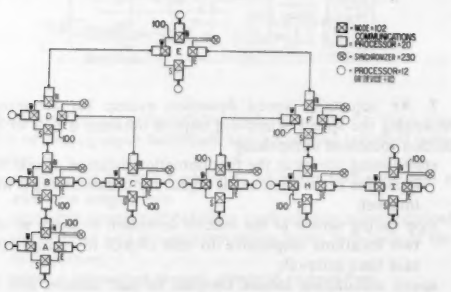
COMMUNICATIONS NETWORK FOR GENERAL PURPOSE DATA COMMUNICATIONS IN A HETEROGENEOUS ENVIRONMENT

Ulbe Faber, Honeybrook, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 29, 1975, Ser. No. 581,938

Int. Cl.² H04Q 9/00

U.S. Cl. 340—147 R **16 Claims**



1. A method of communicating data between a plurality of information handling units arranged in a series loop configuration comprising the steps of:

generating a plurality of undedicated information limited slots for carrying signals;

organizing said plurality of undedicated information limited slots into a continuous sequence of undedicated information carrying slots;

conveying said organized continuous sequence of undedicated information carrying slots onto said series loop configuration;

dedicating on demand at each of said plurality of information handling units the first available undedicated information carrying slot for receiving information signals to be communicated from said respective information handling unit; and

undedicating on demand at each of said designated ones of said information handling units said dedicated information carrying slots when delivering said received information signals.

4,031,513

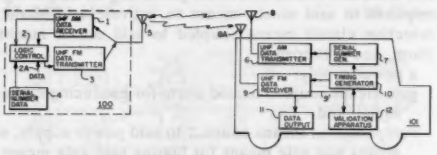
RF DATA EXCHANGE SYSTEM

Walter Simciak, Longwood, Fla., assignor to Northern Illinois Gas Company, Aurora, Ill.

Filed Nov. 8, 1974, Ser. No. 522,019

Int. Cl.² H04Q 9/00

U.S. Cl. 340—152 T **12 Claims**



1. In a remote meter reading system having an individual transponder for each of a plurality of remotely located meters and interrogate means for energizing, requesting and receiving information from a selected one of said transponders, said interrogate means including interrogate transmitter means for transmitting electromagnetic signals over a UHF AM radio channel to initiate the readout of the information from said selected one of said plurality of remotely located meters, each of said transponders including data receiver means for receiving the UHF AM signals and data transmitter means responsive to said data receiver means for retransmitting UHF FM radio signals comprised of a carrier signal modulated by signals of predetermined frequencies for representing the information requested by said interrogate transmitter means, said interrogate means further including interrogate receiver means for receiving the UHF FM radio signals and validation means responsive to said interrogate receiver means to provide a control output for enabling said interrogate transmitter means to continue the readout of information from the selected meter whenever the UHF FM radio signals received by said interrogate receiver means are modulated at said predetermined frequencies.

4,031,514

ADDRESSING SYSTEM IN AN INFORMATION PROCESSOR

Toshimasa Kihara, Kunitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 2, 1975, Ser. No. 609,605

Claims priority, application Japan, Sept. 4, 1974, 49-100924

Int. Cl.² G06F 9/20

U.S. Cl. 364—200 **4 Claims**

1. An addressing system for an information processor comprising:

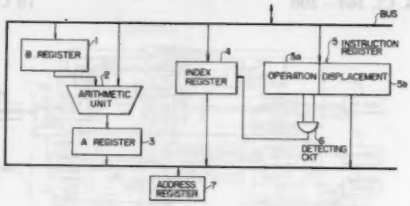
a data bus by way of which data is transmitted within the system;

an index register having an input and an output coupled to said data bus;

an address register having an input coupled to said data bus;

an instruction register, including an operation part and an address part and havng an input coupled to said data bus, said address part having an output coupled to said data bus;

an adder, having a first input coupled to receive the contents of said index register and a second input coupled to



receive the contents of the address part of said instruction register, for adding said respective contents to each other to provide a summation output;

detection means, responsive to the state of selected bits of the operation part of said instruction register, for causing the summation output of said adder to be supplied to said index register and stored in said address register upon the state of said selected bits being a preselected state, and for otherwise preventing the summation output of said adder from being supplied to said index register.

4,031,515

APPARATUS FOR TRANSMITTING CHANGEABLE LENGTH RECORDS HAVING VARIABLE LENGTH WORDS WITH INTERSPERSED RECORD AND WORD POSITIONING CODES

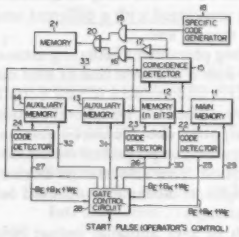
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1975, Ser. No. 572,871

Claims priority, application Japan. May 1, 1974, 49-48289; May 2, 1974, 49-49494

Int. Cl.² G06F *5/02, 7/34*

U.S. Cl. 364—200 **13 Claims**



1. A system for transmitting data to an output means, comprising:

a source of a plurality of records serially arranged with record positioning codes interposed therebetween, said records including a plurality of words serially arranged with word positioning codes interposed therebetween;

main memory means coupled to said source for temporarily storing said serially arranged records and record positioning codes;

auxiliary memory means coupled to said main memory means for temporarily storing a record including words of different lengths read out from said main memory means based on said record and word positioning codes;

comparator means coupled to said main and auxiliary memory means for comparing any one of the words of a record read out from said auxiliary memory means with the corresponding word of said record read out from said main memory means immediately after said record which was read out from said auxiliary memory means; and

control circuit means coupled to said main memory means and to said comparator means for transmitting to the output means the record read out from the main memory means immediately after said record which was read out from said auxiliary memory means, in the original form, whenthe corresponding words are detected by said comparator means not to be identical and for transmitting the record to the output means with the corresponding word omitted when the corresponding words are detected by said comparator means to be identical.

4,031,516

TRANSMISSION DATA PROCESSING DEVICE

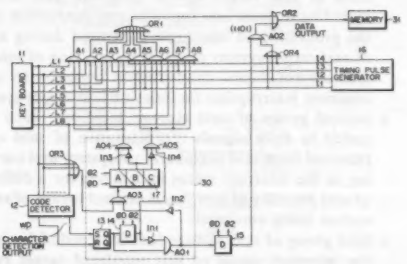
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed June 4, 1975, Ser. No. 583,845

Claims priority, application Japan, June 7, 1974, 49-63932

Int. Cl.² G06F *13/00*

U.S. Cl. 364—200 **12 Claims**



1. A transmission data processing device for serially transmitting records each constituted by data word of variable length which have word positioning codes (*wp*) interposed among them and each of which includes a spontaneous number of binary-coded characters, said device comprising:

a memory means (**31**) for storing as a series transmission data a record comprised of predominantly numeric data characters coded in *n* bits, of data characters including at least one character and coded in *m* bits and of specific function codes (α) of *n* bits and inserted immediately before at least said data characters and contained in each data word, where *n* is smaller than *m;*

means (**AO 6**) coupled to said memory means (**31**) for detecting said function codes (α) read out from said memory means (**31**);

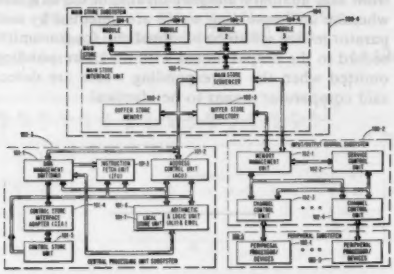
bit configuration designating means (**OR 5,** delay **23** AND **AO 8**) having an input coupled to said detecting means (**AO 6**) for reading in *m*-bit configuration the data characters from said memory means (**31**) after said detection means produces a detection output; and

means (**AO 5,** I*n* **9**) coupled to said memory means (**31**) and to said designating means (**OR 5,** delay **23,** AND **AO 8**) for releasing the *m*-bit configuration designating mode of said designating means upon detection of an *n* bit word positioning code.

4,031,517
EMULATION OF TARGET SYSTEM INTERRUPTS THROUGH THE USE OF COUNTERS

Allen C. Hirtle, Needham, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Apr. 24, 1974, Ser. No. 463,700
Int. Cl.² G06F 9/18
U.S. Cl. 364—200 26 Claims



1. A data processing system for handling interrupts received from a peripheral subsystem coupled to said data processing system during the execution of a target system program from a plurality of target system peripheral control means which in the target system being emulated couple to a plurality of peripheral devices, and connect in common to share the common interrupt hardware facilities of said target system said data processing system including:

a main store having a plurality of storage locations;

a first group of said storage locations coded to store instructions of said target system program, said instructions including at least one input/output instruction involving the processing of interrupts generated during execution of said target system program by any one of said peripheral control means connected in common to share the common interruption facilities of said target system;

a second group of said storage locations, each location coded to store signals representative of said interrupts received from said peripheral subsystem and corresponding to the interrupt status indications for a different one of said plurality of peripheral control means of said target system being emulated;

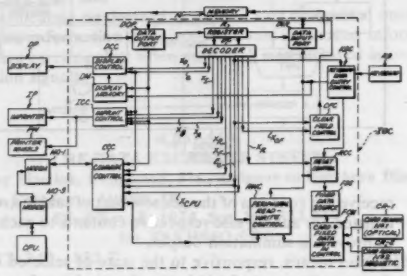
a third group of said storage locations coded for indicating the interrupt status of said emulated target system, at least one of said locations storing an interrupt count representing the number of said peripheral control means of said emulated target system having interrupt conditions; and,

microprogram control means for storing sequences of microinstructions for conditioning said system for processing instructions in at least first and second modes, said control means including branch means, said branch means when said control means is operated in a first mode during the execution of a target system input/output instruction coded to specify the altering of the interrupt status signals of a specified one of said plurality of target systems peripheral control means is caused by said instructions to reference a predetermined one of said sequences, said microprogram control means further including decode means, said decode means being conditioned by microinstructions of said one sequence to generate signals for conditioning said data processing system to switch one of said second group of said locations storing signals corresponding to interrupt status indicators of said specified peripheral control means to a predetermined state and generate signals for modifying the interrupt count contents of said one location of said third group for indicating said interrupt status of all of said plurality of peripheral control means.

4,031,518
DATA CAPTURE TERMINAL

Thomas Patrick Holloran, Aurora; Arthur Buell Braden, Mentor; Jerrold Stokes Foley, Stow; James Lucian Maynard, Northfield; John Patrick Klosky, Mentor; Gerald Anthony Dissauer, South Euclid; Terrence Miller Adams, Kirtland, and Allan Alfred Lorenz, Mentor, all of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 26, 1973, Ser. No. 373,884
Int. Cl.² G06F 3/00, 13/02
U.S. Cl. 364—200 16 Claims



1. A data capture terminal for use in a data communication system, wherein data including output peripheral commands and associated messages are received from a remote device, comprising:

memory means for receiving data for storage therein;

means for entering all output peripheral data from a remote device, including output peripheral commands having associated messages, into said memory means for storage thereby;

communication means, including for receiving data from said remote device and supplying said output peripheral data to said data entering means for entry into said memory means;

means for periodically and non-destructively outputting said data from said memory means;

a plurality of output peripheral means;

a corresponding plurality of actuatable output peripheral control means, each coupled to said outputting means and exposed to all said data outputted therefrom, and each being associated with a different one of said output peripheral means; and

a corresponding plurality of actuating means, each similarly associated with a different one of said output peripheral control means and coupled to said outputting means, for actuating its associated peripheral control means whenever the outputted data includes a command intended for its associated output peripheral means, so that thereby all communication from said remote device to a particular output peripheral means is conducted only through said memory means;

wherein each of said actuable output peripheral control means, when actuated by its corresponding actuating means, commands the associated peripheral means to perform a function in accordance with said associated output peripheral command upon the particular message associated therewith.

4,031,519
PRINTER

Gerald I. Findley, Morgan Hill, Calif., assignor to IBM Corporation, Armonk, N.Y.

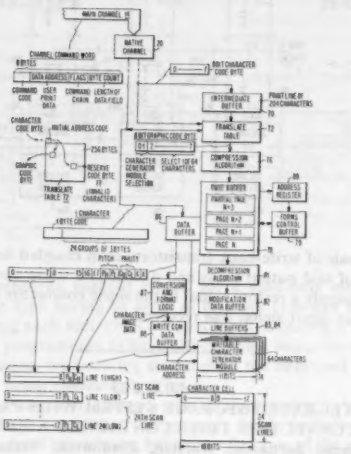
Filed Nov. 11, 1974, Ser. No. 522,998
Int. Cl.² G06F 3/12, 7/34, 13/00; G06K 15/02
U.S. Cl. 364—900 36 Claims

1. A system for printing characters in response to coded data comprising:

means for storing a plurality of different sets of graphical data, each set of graphical data being identified by a particular address and defining the portions of a grid pattern which a particular character comprises;

means responsive to receipt of the coded data by the system for assembling the data into a group representing a plurality of characters to be printed;

means responsive to assembly of the coded data into a group for translating each portion of the coded data representing a character into a corresponding address, the means for translating including means for storing



addresses in a plurality of different storage locations and means responsive to the value of each portion of the coded data representing a character for selecting a storage location to provide the address stored therein;

means responsive to each address from the means for translating for selecting the corresponding set of graphical data from the means for storing sets of graphical data corresponding to the address;

grid pattern scanning print means; and

means responsive to each selected set of graphical data for modulating the scanning print means in accordance with the graphical data to print a character.

4,031,520

MULTISTAGE SORTER HAVING PUSHDOWN STACKS WITH CONCURRENT ACCESS TO INTERSTAGE BUFFER MEMORIES FOR ARRANGING AN INPUT LIST INTO NUMERICAL ORDER

Michel Alexandre Rohner, San Jose, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,849

Int. Cl.[2] G06F *7/24*

U.S. Cl. 364—200 **15 Claims**

1. An M stage sorter for arranging input members into a numerical order, comprising:

means for grouping the input numbers into groups;

a first stage for ordering the input numbers within each of the groups, and formed by:

first stage input means for sequentially receiving all of the input numbers within each of the groups;

first stage means for comparing each currently received input number to the previously received numbers from the same group; and

first stage storage means for inserting each currently received input number into proper numerical order among the numbers previously received from the same group;

M-1 subsequent sequential stages for progressively forming fewer groups of more numbers each, the last stage of which provides all of the input numbers in numerical order, each stage formed by:

interstage storage means for storing the ordered groups from the preceding stage;

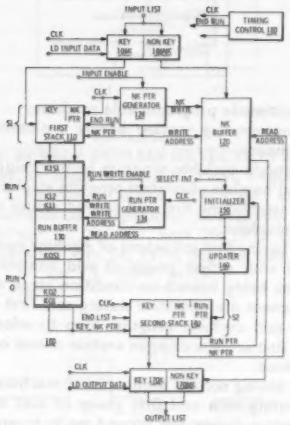
stack input means for sequentially receiving each of the numbers stored in the interstage storage means;

stack comparing means for comparing each currrently received number to the previously received numbers currently in the sorting stack;

stack pushdown storage means for inserting each currently received number into proper numerical order among the previously inserted numbers, which pushdown stormeans progressively fills up from a first-filled position to a last-filled position as each currently received number is inserted;

interstage output means for advancing the current number in the last filled position to the next stage;

replacement means for holding a replacement number from the interstage storage means for insertion into the stack pushdown storage means via the stack input means and stack comparing means as each current output number is advanced from the last filled position of the pushdown storage means to the interstage output means;



candidate pointer means for providing a candidate pointer for a next replacement number candidate for each replacement number from the interstage storage means prior to entering the replacement means for identifying candidates for the next replacement number;

first access means for permitting the candidate pointer for the current replacement number in the replacement means to access a first candidate for the next replacement number from the interstage storage means;

second access means for permitting the candidate pointer for the current number in the last filled position of the pushdown storage means to access a second candidate for the next replacement number from the interstage storage means; and

a candidate comparing means for selecting the next replacement number from the two candidates for entry into the replacement means as the current replacement number is inserted into the stack pushdown storage means; and

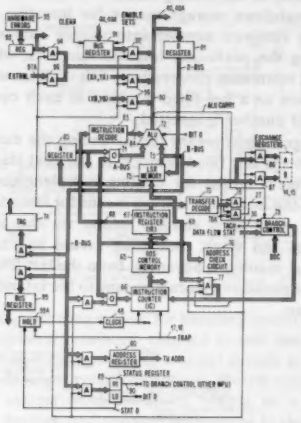
output means for receiving the numbers in numerical order from the last of the M sequential stages.

4,031,521

MULTIMODE PROGRAMMABLE MACHINES

Phil H. Hall, and John W. Irwin, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 15, 1971, Ser. No. 189,576
Int. Cl.² G06F 9/16
U.S. Cl. 364—200 **8 Claims**



1. A multimode programmable machine,
a microprocessing portion having a plurality of program step means,
a multimode cyclable program loop including a predetermined number of control program step means,
means establishing first and second modes of operation in said machine,
means having first sequences of machine operation cooperating with a first group of said control program step means being branch-on-condition steps and which first sequences are operative during said first mode to interrupt said cyclable program loop to selectively execute said first sequences upon certain events occurring in the machine,
means having second sequences of machine operation cooperating with said first group of said step means and operative during said second mode to supply first timed control signals of momentary duration in accordance with a continuous recycling of said program loop for indicating elapsed time, and
said machine having circuit means responsive to said control signals to perform predetermined machine functions in accordance therewith.

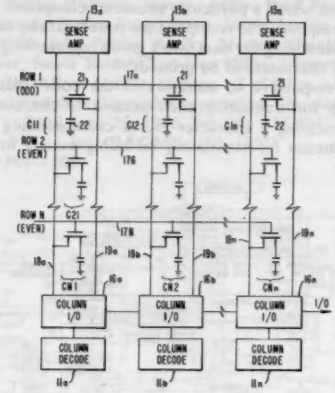
4,031,522

ULTRA HIGH SENSITIVITY SENSE AMPLIFIER FOR MEMORIES EMPLOYING SINGLE TRANSISTOR CELLS

John Anthony Reed, Los Altos, and Joel Allen Karp, Palo Alto, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed July 10, 1975, Ser. No. 594,579
Int. Cl.² G11C 11/40
U.S. Cl. 340—173 R **10 Claims**

1. A differential sense amplifier and restore circuitry comprising:
a pair of sense conductors;
a pair of transistors cross-coupled to form a latch to sense a difference in voltage potential between said sense conductors, said latch having a pair of output leads and a pair of input leads;
a pair of source followers, each coupled between one of said sense conductors and one of said input leads to receive an input signal from one or the other of said sense conductors; and



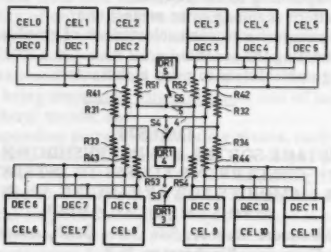
a pair of write-back transistors, each coupled between one of said output leads and one of said sense conductors to supply a restore signal to the sense conductor from which an input signal was received.

4,031,523

INTEGRATED STORAGE SYSTEM WITH PARALLEL CONNECTION LINES CONTAINING A RESISTOR

Johannes Bernardus Horsten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 500,951, Aug. 27, 1974, abandoned.
This application Oct. 7, 1975, Ser. No. 620,301
Claims priority, application Netherlands, Sept. 11, 1973, 7312487
Int. Cl.² G11C 5/06, 7/00
U.S. Cl. 340—173 R **6 Claims**



6. A memory system comprising
a plurality of bit-organized storage cells, each cell storing a plurality of bits;
a first network of first connecting lines connecting said storage cells, each one of said lines including a first junction point with at least another one of said lines, and a resistor connected in series with said one line;
a plurality of drive units for supplying signals to said storage cells; and
a second network of second connecting lines for connecting each of said drive units with at least one second junction point, said at least one second point being connected with said resistor of each respective one of said first connecting lines connected to said at least one second junction point; and
a plurality of capacitors connected between each respective one of said first connection line and ground; whereby said

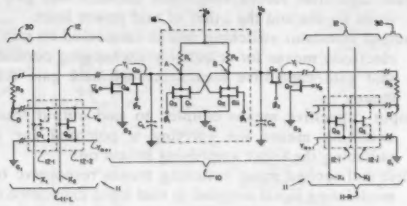
first network forms an integrating RC network with a minimal integration time for each first connection line.

4,031,524

READ-ONLY MEMORIES, AND READOUT CIRCUITS THEREFOR

Richard H. Heeren, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Oct. 17, 1975, Ser. No. 623,870
Int. Cl.² G11C *11/40, 17/00*
U.S. Cl. 340—173 R 26 Claims



1. An improved readout circuit for a read-only memory bank of the type having an array of memory cells and means for accessing each individual cell, each cell including a memory device programmed to have either a high impedance or a low impedance, representing stored data, the improved readout circuit being characterized by:

a. a sense amplifier having a pair of input nodes;

b. means for connecting the memory bank, including the selected cell impedance, between a first one of the amplifier nodes and a circuit reference node, the total impedance of the memory bank, including that of the selected cell, having a first, "ON" value if the memory device in the selected cell is in the low-impedance state, and a second, "OFF" value if the memory device is in the high-impedance state; and

c. means for connecting a reference impedance between the other amplifier node and the reference node, the reference impedance having a value between the ON bank impedance and the OFF bank impedance;

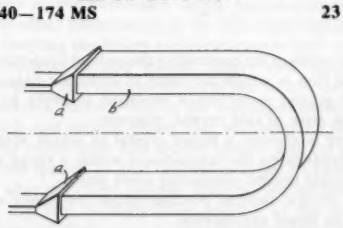
d. the sense amplifier including means for sensing a difference in the impedance connected to the two amplifier nodes and for generating a binary output signal in response to the sensed difference, representing the data stored in the selected memory cell.

4,031,525

PROCESS FOR RECORDING AND REPRODUCTION OF INFORMATION IN ELECTROMAGNETIC FORM

Horst Volz; Reinhard Straubel, and Arnulf Hager, all of Berlin, Germany, assignors to VEB Kabelwerk Oberspree (KWO), Berlin-Oberschoeneweide, Germany

Filed Apr. 8, 1974, Ser. No. 458,933
Int. Cl.² G11C *13/00*
U.S. Cl. 340—174 MS 23 Claims



1. A process for the storage and readout of information in electromagnetic form which comprises:

a. modulating an information carrier with an information signal, within the range of the reversible permeability or reversible dielectric constant of said information carrier, wherein the information carrier is comprised of a material selected from a group consisting of ferromagnetic, ferrimagnetic, antiferrimagnetic, ferroelectric and antiferroelectric, metamagnetic, materials, said modulating comprising propagating said signal along a conductor,

b. forming an image of said information signal along the propagation path of the information carrier in the form of values of residual magnetism and/or residual dielectric polarization by short term high frequency pre-magnetization and/or short term high frequency dielectric pre-polarization of said information carrier, comprising applying an alternating electromagnetic field to said carrier, and

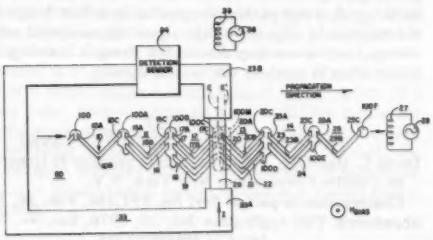
c. reading out the stored information by a short term magnetization step and/or short term dielectric polarization step comprising applying an alternating electromagnetic field to said carrier.

4,031,526

MAGNETIC BUBBLE DOMAIN DETECTION DEVICE

John L. Archer, Orange; Leonard R. Tocci, Laguna Niguel, and Jeffrey L. Williams, Corona, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 290,607, Sept. 20, 1972, abandoned.
This application May 24, 1976, Ser. No. 689,435
Int. Cl.² G11C *19/08*
U.S. Cl. 340—174 TF 6 Claims



1. A magnetic device comprising,

a magnetic film capable of maintaining isolated domains therein wherein said domains have different magnetic polarization than said film,

a plurality of magnetizable areas on said magnetic film for controlling the position of said isolated domains in said film,

at least some of said plurality of magnetizable areas arranged adjacent to each other for expanding said isolated domains in a direction different from the direction of motion of said domains through said magnetic film, and

detector means adjacent to said magnetizable areas for detecting the presence of an expanded isolated domain at said magnetizable areas,

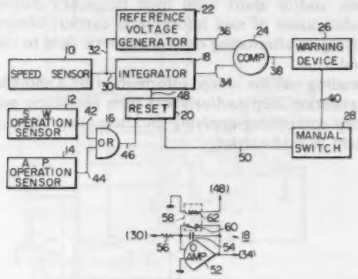
said detector means including a single magnetoresistive element the resistance of which varies as a function of the proximity of said expanded isolated domain,

said magnetizable areas disposed on said magnetic film under said detector means.

4,031,527
ELECTRONIC ALERTING SYSTEM FOR A VEHICLE DRIVER

Takayuki Yanagishima, and Naohiko Inoue, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 3, 1975, Ser. No. 592,983
Claims priority, application Japan, July 8, 1974, 49-77315
Int. Cl.² G08B 21/00; B60K 28/00; B60T 7/19
U.S. Cl. 340—279 **3 Claims**

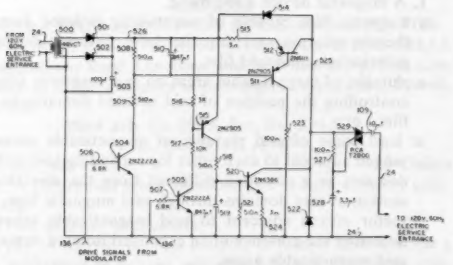


1. A safety system for alerting a driver when said driver becomes drowsy while operating a motor vehicle, comprising a steering wheel operation sensor for producing a first signal when a steering wheel of said motor vehicle rotates through an angle larger than a predetermined angle; an accelerator operation sensor for producing a second signal when an accelerator pedal of said motor vehicle is displaced through a distance larger than a predetermined distance; signal generating means including a speed sensor for producing a third signal representing the speed of said motor vehicle, and an integrator for integrating said third signal into a voltage signal representing the distance travelled by said vehicle until it is reset, into its initial state, by at least one of said first and second signals; a reference voltage generator for producing a reference voltage, the magnitude of which is variable in accordance with said third signal; a comparator for producing a fourth signal when the magnitude of said voltage signal exceeds said reference voltage; and a warning device for giving a warning to said driver when it receives said fourth signal.

4,031,528
TRANSMITTING OVER POWER LINES

David C. Harrison, Arlington, Mass., assignor to General Public Utilities Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 551,356, Feb. 20, 1975, abandoned. This application July 26, 1976, Ser. No. 708,394
Int. Cl.² H04M 11/04
U.S. Cl. 340—310 R **7 Claims**

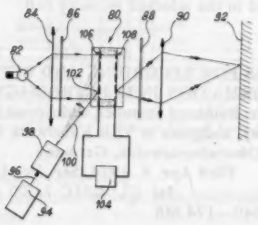


1. Apparatus for transmitting over power lines comprising,
a source of a unipolar potential derived from electrical power on said power lines,
a source of a modulating signal of carrier frequency for interrupting said unipolar potential at a rate corresponding to said carrier frequency,
and means for coupling the interrupted unipolar potential to said power lines to provide a carrier signal of said carrier frequency on said power lines,
said means for coupling comprising gated semiconductor switching means having gate electrode means and input and output electrode means in series with one of said power lines,
gate resistive means connected between said input and gate electrode means,
gate capacitive means connected between said gate electrode means and the other of said power lines,
output transistor switching means connected to said input electrode means for selectively exchanging current with said gate capacitive means through said gate resistive means,
input capacitive means coupled to said output transistor switching means for carrying a potential for slowly switching the latter amplifying means on,
first and second input switching means responsive to said modulating signal coupled to said input capacitive means and rendered conductive during alternating contiguous time intervals at said carrier signal frequency for alternately charging and discharging said input capacitive means and thereby slowly switching on said switching off said transistor switching means whereby said gated semiconductor switching means delivers to said power line a slowly rising and falling current provided by said transistor switching means.

4,031,529
THERMAL METHOD FOR CONTROLLING THE OPTICAL PROPERTIES OF A LIQUID CRYSTAL AND DEVICES FOR THE APPLICATION OF SAID METHOD

Joseph Borel, Echirolles, and Jacques Robert, St-Egreve, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 22, 1975, Ser. No. 643,144
Claims priority, application France, Dec. 24, 1974, 74.42766
Int. Cl.² G02F 1/13
U.S. Cl. 340—324 R **17 Claims**

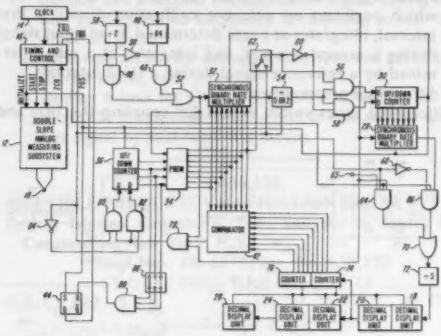


1. A method for controlling the optical properties of a liquid crystal film in which the value of dielectric anisotropy of the liquid crystal molecules is modified in order to control the optical state of said crystal, wherein:
there is chosen a liquid crystal in which said anisotropy depends on the temperature within a range in which the liquid crystal retains the same phase,
an electric field of predetermined frequency is applied to the liquid crystal film,
the temperature of the liquid crystal film is brought to a value located within said range, the dielectric anisotropy then assumes a predetermined value in respect of the value of said frequency and the liquid crystal film then assumes a predetermined optical state.

4,031,530
DIGITAL SECOND-ORDER CLOCK LINEARIZER

Nicholas E. Aneshansley, Centerville, Ohio, assignor to Instrulab Incorporated, Dayton, Ohio

Filed Oct. 22, 1975, Ser. No. 624,598
Int. Cl.² H03K 13/02, 13/20
U.S. Cl. 340—347 NT 13 Claims



1. A linearizer for processing a non-linear signal comprising:

A. a first source of timing pulses;

B. a first synchronous binary rate multiplier, said first binary rate multiplier having a signal input terminal, a signal output terminal, and a plurality of rate control input terminals;

C. means coupling timing pulses from said first source to said signal input terminal of said first synchronous binary rate multiplier;

D. a second source of timing pulses, the pulses from said second source occurring at a lower frequency than the pulses from said first source;

E. a second synchronous binary rate multiplier, said second binary rate multiplier having a signal input terminal, a signal output terminal, and a plurality of rate control input terminals;

F. means coupling timing pulses from said second source to said signal input terminal of said second synchronous binary rate multiplier;

G. a first counter, said first counter having an increment input terminal and a plurality of output terminals which issue output signals representative of the instantaneous count held therein;

H. means coupling said signal output terminal of said second synchronous binary rate multiplier to said increment input terminal;

I. means individually coupling said output terminals from said first counter to said rate control input terminals of said first binary rate multiplier;

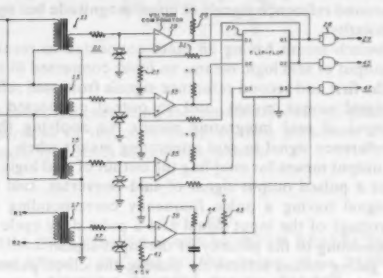
J. means for developing a binary representation of the second order of the correction factor instantaneously required to effect linearization of the non-linear signal; and

K. means coupling the binary representation to said control input terminals of said second binary rate multiplier whereby the binary representation of the second order of the correction factor controls the fractional multiplication which said second binary rate multiplier applies to the timing pulses from said second source, and the resultant pulses applied to said increment input to said first counter alter the count therein, thereby correspondingly altering the rate multiplication applied to the timing pulses from said first source by said first binary rate multiplier, the linearized pulses issuing from said output terminal of said first binary rate multiplier therefore being linearized in accordance with the instantaneously desired correction factor.

4,031,531
SYNCHRO-TO-DIGITAL CONVERTER

Jeffrey C. Rice, McLean, and Terry A. Tucker, Charlottesville, both of Va., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,073
Int. Cl.² H03K 13/02
U.S. Cl. 340—347 SY 3 Claims



1. A synchro-to-digital converter comprising individual transformer means to receive the three stator output voltages and a sample of the rotor excitation voltage from an external synchro, individual channels coupled to said transformer means for processing each stator voltage, and means to produce a clock pulse at a predetermined point in each cycle of the rotor excitation voltage; each of said channels including voltage comparator means having a first input terminal coupled to receive a stator output voltage from the associated transformer means and a second input terminal for applying a threshold potential to the comparator so that the comparator produces a switching signal when and only when the associated stator output voltage exceeds the threshold potential, bistable switching means coupled to receive switching signals from the comparator in the same channel, said bistable means being constructed and arranged to switch to first or second bistable states in response to a clock pulse occurring in the presence or absence, respectively, of a switching signal, said second input terminal being coupled to ground potential through a resistance element and to the output of said bistable switching means through a feedback loop so that said threshold potential is at ground level in the absence of a switching signal but is depressed to a lower level at the inception of a switching pulse, output means on each switching means for producing steady output signals indicative of the bistable state of the switching means in the corresponding channel, the output means in the three channels being arranged to provide simultaneous binary-valued output signals in a known digital code format.

4,031,532
VOLTAGE TO FREQUENCY CONVERTER

David J. First, c/o D. J. Instruments Inc., 11 Esquire Road, North Billerica, Mass. 01862

Filed Dec. 29, 1975, Ser. No. 644,879
Int. Cl.² H03K 13/02
U.S. Cl. 340—347 NT 6 Claims

1. A voltage to frequency converter comprising:

A. integrating means having an input connected to receive an input signal and an output;

B. level detecting means responsive to the output of said integrating means for producing an output at a first level responsive to the integrating means output being greater than a predetermined level and an output at a second level responsive to the integrating means output being less than said predetermined level;

C. clock means for generating a clock signal including periodic clock pulses;

D. logic means having an input connected to receive the output of said level detecting means, an input connected

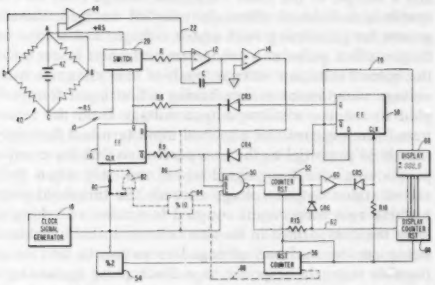
to receive the clock pulses from said clock means and an output for producing an output at a first level responsive to the receipt of a clock pulse and the output of said level detecting means being at the first level and for producing an output at a second level responsive to the receipt of a clock pulse and the output of said level detecting means being at the second level;

E. reference signal source means for producing first and second reference signals of equal magnitude but opposite polarity;

F. switch means having an input connected to receive the output of said logic means, an input connected to receive the first and second reference signals from said reference signal source means, and an output connected to the input of said integrating means for applying the first reference signal to said integrating means when

G. output means for coupling the output of said logic means as a pulsed output signal of said converter, said output signal having a pulse frequency corresponding to the voltage of the input signal and a pulse duty cycle corresponding to the polarity of the input signal;

H. gating means selectively passing the clock pulses from said clock means to its output during the time period in which the output of said logic means is at one of the first or second levels; and



I. counting means connected to the output of said gating means for establishing a digital count corresponding to the voltage of the input signal,

said counting means comprising

1. a first counter connected to receive the output of said gating means:

2. dividing means having an input for receiving clock pulses from said clock means for producing an output having a frequency equal to one half the frequency of the clock pulses from said clock means;

3. a second counter connected to receive the output of said dividing means;

4. a third counter coupled to the output of said gating means;

5. means responsive to said first counter attaining a selected count for passing the clock pulses passed by said gating means to said third counter; and

6. means responsive to said second counter attaining said selected count for resetting said first and second counters, the count into said third counter corresponding to the net voltage of the input signal over the time period required for said second counter to attain said selected count.

4,031,533

DIFFERENTIAL FLOATING DUAL SLOPE CONVERTER

Leopold Neumann, Lexington, Mass., assignor to Analogic Corporation, Wakefield, Mass.

Filed Oct. 2, 1975, Ser. No. 618,783
Int. Cl.[2] H03K *13/00*
U.S. Cl. 340—347 NT **13 Claims**

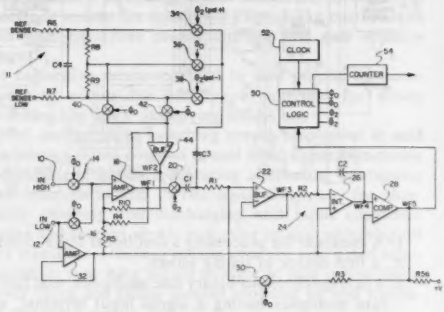
1. For use with a transducer providing a low level differential analog signal representative of a sensed condition, said signal providing a first, lower voltage level and a second, higher voltage level relative to each other, a ratiometric analog-to-digital converter comprising:

an autozeroed dual slope analog-to-digital converter circuit operative to provide a digital representation of said differential analog signal;

the dual slope analog-to-digital converter being of the type which performs an autozero calibration during a first interval, integrates at a rate determined by an input signal during a second interval, and integrates at a rate determined by a reference signal during a third interval;

a differential preamplifier;

differential input switch means for coupling the first and



second levels of said differential analog signal respectively during the first and second intervals to one input of said preamplifier;

first means for selectively capacitively coupling the output of said preamplifier to the input of said converter circuit during said first and second intervals;

reference means operative to differentially sense the excitation of said transducer and provide reference and offset signals to said converter circuit; and

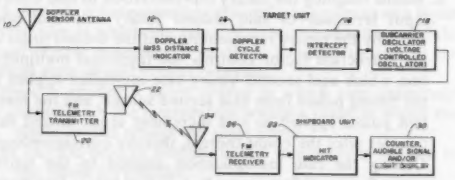
second means for selectively coupling during said first interval said reference means to the input of said converter circuit for analyzing said offset signal thereto, and for coupling during said third interval a reference signal to the input of said converter circuit which reference signal is integrated by said converter circuit.

4,031,534

NOISE RESISTANT ZONE PENETRATION DETECTION SYSTEM

George T. Kallmann, Pacific Palisades, and Theodore P. Waddell, Port Hueneme, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 1, 1976, Ser. No. 691,924
Int. Cl.[2] G01S *9/04*
U.S. Cl. 343—12 MD **12 Claims**



1. A system for detecting the existence of a projectile within a penetration zone of a target and providing a score indication for each projectile comprising:

a. doppler miss distance indication means for producing a

beat frequency signal whenever said projectile is moving within said penetration zone;

b. means for producing a target detection pulse having a predetermined pulse width in response to detection of said beat frequency signal within a predetermined frequency range;

c. means for transmitting from said penetration zone a first FM subcarrier signal having a first predetermined frequency and a second FM subcarrier signal having a second predetermined frequency in response to said target detection pulse;

d. receiving means for detecting said first and second subcarrier signal; and

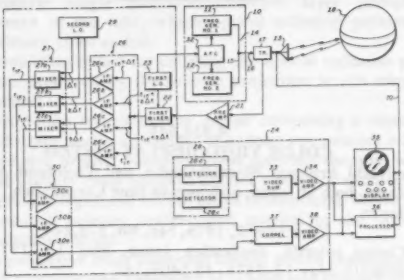
e. display means for providing a score indication for each projectile in response to detection of said second subcarrier signal by said receiving means.

4,031,535

MULTIPLE FREQUENCY NAVIGATION RADAR SYSTEM

Eric J. Isbister, Greenlawn, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,553
Int. Cl.² G01S 9/56; H01Q 15/14
U.S. Cl. 343—6.5 R **11 Claims**



1. A detection and identification system comprising

transmitter means for producing a multiplicity of signals each having a different frequency with a known frequency separation therebetween;

means coupled to said transmitter means for radiating said multiplicity of signals;

signal generating means for receiving said multiplicity of signals and for producing signals at frequencies that are linear combinations of the frequencies of said multiplicity of signals including signals at frequencies of said multiplicity of radiated signals and re-radiating said produced signals; and

means for receiving said re-radiated signals and producing output signals in response to said re-radiated signals whereby said signal generating means may be identified.

4,031,536

STACKED ARRAYS FOR BROADCASTING ELLIPTICALLY POLARIZED WAVES

Andrew Alford, 120 Cross St., Winchester, Mass. 01890

Filed Nov. 3, 1975, Ser. No. 628,247
Int. Cl.² H01Q 21/24
U.S. Cl. 343—796 **10 Claims**

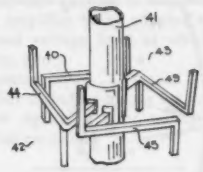
1. A radiating element comprising:

a. Two substantially similar metal conductors each having a central portion and two end portions with the end of the central portion of one conductor located close to the end of the central portion of the other conductor,

b. Said central portions arranged at an angle with each other in substantially the same plane,

c. The end portions of each conductor pointing in opposite directions from the plane containing the central portions,

d. The end portions of the two conductors at the proximate ends of the central portions pointing in opposite directions,



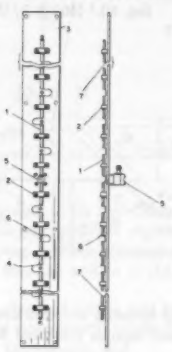
e. Means for energizing the proximate ends of the central portions of the conductors at their proximate ends by radio frequency in opposite phases.

4,031,537

COLLINEAR DIPOLE ARRAY WITH REFLECTOR

Andrew Alford, 120 Cross St., Winchester, Mass. 01890

Filed Oct. 23, 1974, Ser. No. 513,587
Int. Cl.² H01Q 1/02, 9/20
U.S. Cl. 343—704 **5 Claims**



1. An antenna array comprising a collinear chain of dipoles, a reflecting plate, phasing loops connected between consecutive dipoles and located on the same side of the reflecting plate as the dipoles "said phasing loops having major portions substantially parallel to said reflecting plate", means for spacing the dipoles from the reflecting plate less than a quarter wavelength at the operating frequency, means for spacing the phasing loops at a smaller distance from the plate than the dipoles and means for energizing said chain of dipoles from one end.

4,031,538

ANTENNA WITH ECHO CANCELLING ELEMENTS

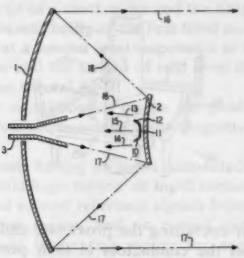
Carl William Lundgren, Jr., Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 21, 1975, Ser. No. 597,367
Int. Cl.² H01Q 19/14
U.S. Cl. 343—781 CA **10 Claims**

1. An antenna having a main reflector, a smaller subreflector, and feeding means so arranged that radiation from said feeding means is reflected successively from said subreflector and said main reflector,

wherein the improvement comprises a reflective band located near said subreflector between said subreflector and said feeding means, said band having a significant width aspect and having an inner surface flaring outward toward said feeding means,

whereby radiation from said feeding means reflected back



to said feeding means by said subreflector is substantially cancelled in both a lower and a higher frequency range.

4,031,539

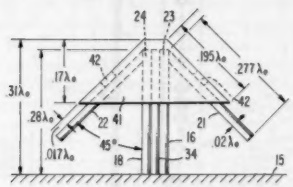
BROADBAND TURNSTILE ANTENNA

Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,761

Int. Cl.² H01Q 21/26

U.S. Cl. 343—797 **7 Claims**



1. A broadband turnstile antenna comprising:

a pair of crossed dipoles mounted forward of a reflective surface,

said dipoles being center fed with the legs of the dipoles fed with equal power in the relative phase rotation of 0°, 90°, 180° and 270°, and

a single member of conductive material closely spaced forward of said dipole legs and separated therefrom with said member overlapping the feed point of said dipoles and a substantial portion of said dipole legs.

4,031,540

IMPEDANCE MATCHING DEVICE

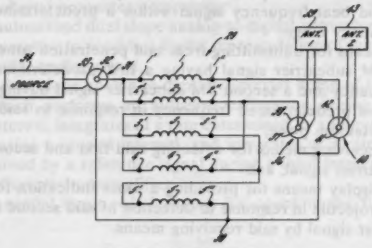
Emil G. Borys, Jr., Rockford, Ill., assignor to Hydrometals, Inc., Chicago, Ill.

Filed Feb. 17, 1976, Ser. No. 658,288

Int. Cl.² H01Q 1/50

U.S. Cl. 343—860 **6 Claims**

1. An impedance matching device for matching the impedances of a pair of antennas to a single source, said device comprising a bifilar transformer having a toroidal core and five mutually coupled windings thereon, first and second of said windings being connected in series in a first branch, third and fourth of said windings being connected in series in a second branch, said first and second branches being connected in parallel, said fifth winding being connected between said parallel combination and a common connection, means providing a connecting point for a first antenna from the junction between said first and second windings and said common point, means providing a connecting point for said second antenna from the junction between said third and fourth windings and said common point, and means providing a connecting point for said source across said series parallel



combination whereby the impedances of said antennas are matched to the impedance of said source.

4,031,541

COLOR VIDEO DISPLAY SYSTEM

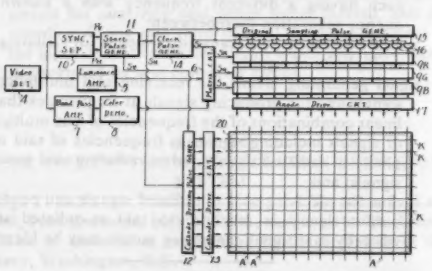
Kuniyoshi Arisawa, Higashikurume, and Yoshifumi Amano, Zushi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 7, 1975, Ser. No. 575,244

Claims priority, application Japan, May 13, 1974, 49-54090[U]; May 13, 1974, 49-54091[U]

Int. Cl.² H04N 9/12

U.S. Cl. 358—56 **9 Claims**



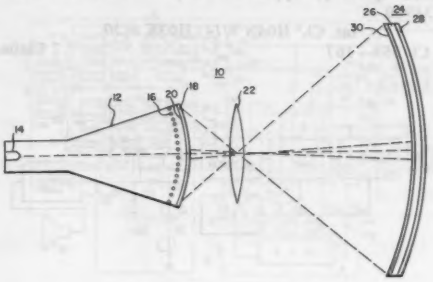
1. A color video display system comprising: a color display panel having a plurality of component color generating means arranged in rows and in columns substantially perpendicular to said rows and arranged to generate a repeating pattern of component colors along selected ones of said rows in a predetermined sequence; means responsive to an input video signal for generating a plurality of component color signals and a synchronizing signal; signal sampling means responsive to said synchonizing signal for sampling said component color signals so that different component color signals are sampled sequentially; means applying the sampled component signals to respective ones of said component color generating means for generating said repeating pattern of component colors along selected ones of said rows; and row selecting means responsive to said synchronizing signal to energize said rows in said predetermined sequence, whereby color pictures are reproduced on said color display panel.

4,031,542

PROJECTION COLOR TELEVISION SYSTEM

Arthur E. Anderson, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1976, Ser. No. 665,132
Int. Cl.² H04N 9/31
U.S. Cl. 358—60 **12 Claims**



1. A projection color television system comprising:
a. cathode ray tube means for converting electronic color television signals to an optical radiation pattern on a uniform single cathodoluminescent layer phosphor screen of the tube, which optical radiation pattern is primary color coded;
b. projection optics for coupling the optical radiation pattern produced by the tube to projection screen display means;
c. projection screen display means comprising a support substrate having a plurality of at least one primary color emissive organic phosphor areas disposed thereon, with the primary color emissive organic phosphor areas being opitcally registered via the projection optics to the corresponding primary color coded portion of the optical radiation pattern.

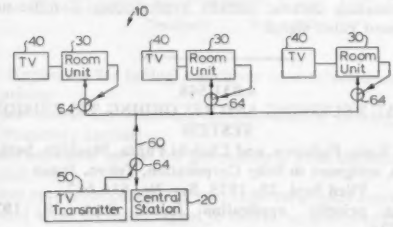
9. A projection color television display screen comprising a support substrate and a plurality of at least two primary color emissive organic phosphor areas, which are absorptive of and excitable by optical radiation, disposed in a regular repeated pattern on the substrate.

4,031,543

COMMUNICATION SYSTEM

George E. Holz, North Plainfield, N.J., assignor to Berkeley Varitronics Systems, Edison, N.J.

Filed Mar. 11, 1974, Ser. No. 450,048
Int. Cl.² H04N 7/16
U.S. Cl. 358—86 **34 Claims**



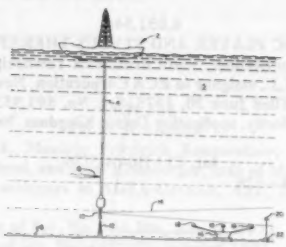
1. A communiction system comprising
a central station and a plurality of remote stations,
a program transmitter at said central station for transmitting program signals representing said programs to all of said remote stations,
second means at each of said remote stations for transmitting information signals to said central station at generally regular but random intervals whereby a relatively large number of remote stations can communicate with a central station without said information signals interfering with each other, said second means including a signal transmitter, switch means for turning on said transmitter at generally regular but slightly random intervals, and a summing amplifier coupled to said switch means,
said summing amplifier being adapted to be charged to a predetermined voltage level at which it operates and switch means, and
a plurality of signal-generating means coupled to said summing amplifier including means for selecting portions of said program signals, a ramp voltage generator, and a random signal generator.

4,031,544

SONAR/TELEVISION SYSTEM FOR USE IN UNDERWATER EXPLORATION

Robert Anthony Lapetina, Salt Lake City, Utah, assignor to Edo Western Corporation, Salt Lake City, Utah

Filed Aug. 11, 1975, Ser. No. 603,696
Int. Cl.² H04N 7/18
U.S. Cl. 358—99 **14 Claims**



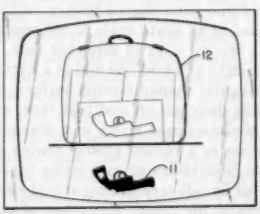
1. A sonar/television system for use with a hollow underwater conductor in locating underwater objects comprising
a first housing having exterior dimensions which enable insertion thereof into the hollow of the underwater conductor,
a television camera disposed within said housing so that the camera is directed downwardly of the housing to record scenes appearing therebelow, and
transducer means carried by said housing for transmitting acoustical signals downwardly of the housing and also generally laterally of the housing through an angle of substantially 360° about the housing and for receiving reflected acoustical signals.

4,031,545

RADIANT ENERGY ALARM SYSTEM

Jay A. Stein, Framingham, and Martin Annis, Newton, both of Mass., assignors to American Science & Engineering, Inc., Cambridge, Mass.

Filed Sept. 8, 1975, Ser. No. 611,230
Int. Cl.² H04N 7/18
U.S. Cl. 358—108 **8 Claims**



1. In a radiant energy imaging system having a scanning

beam of radiant energy that scans a radiant energy detector to provide video signals representative of the opacity of objects intercepting the radiant energy beam alerting apparatus comprising,

a source of a signal of reference level corresponding to a predetermined reference opacity,

means for comparing said video signal with said reference signal to provide a threshold signal when the video signal bears a predetermined relationship to the reference signal,

means for indicating an alarm condition when said threshold signal occurs for a predetermined time interval,

wherein said source of a reference signal comprises a predetermined portion of said video signal produced when said beam is scanning a predetermined reference object of known opacity between said detector and the source of said radiant energy beam.

4,031,546

DISC PLAYER AND STYLUS THEREFOR

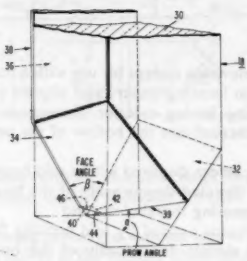
Marvin Allan Leedom, South Brunswick Township, Middlesex County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,953

Claims priority, application United Kingdom, Nov. 18, 1974, 49926/74

Int. Cl.² H04N *5/76*

U.S. Cl. 358—128 **7 Claims**



1. In a disc playback system including a turntable for rotating a spiral grooved disc record of the type which contains an information track in the groove thereof, the combination comprising:

1. an elongated stylus tapering to a tip at one end thereof, said tip having:

a. a substantially flat rear face, with a pair of edges converging at said one end and terminating at the ends of a base edge of a generally right triangular shaped bottom surface;

b. a first side disposed orthogonally relative to said rear face and extending from a first edge of said rear face, said first side terminating at said one end at an altitude edge of said triangular shaped bottom surface; a second side disposed at an acute angle to the rear face extending from a second edge of said rear face, said second side terminating at a said one end at a hypotenuse edge of said triangular shaped bottom surface; and

c. an electrode disposed on said rear face; and

2. means for mounting said stylus in a manner permitting stylus reception in a record groove during record playback with an orientation of said stylus tip bottom such that said stylus tip side terminating at said altitude edge of said bottom faces the center of rotation of said turntable, and the direction of movement of said turntable beneath the point of stylus reception extends from said apex toward said base edge.

4,031,547

NOISE REDUCING CIRCUIT FOR VIDEO SIGNALS

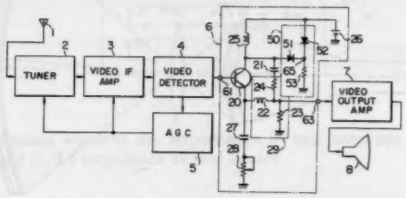
Yukimi Saiki; Masanori Ogino, both of Yokohama, and Shutoku Watanabe, Ashiya, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 18, 1975, Ser. No. 633,114

Claims priority, application Japan, Nov. 21, 1974, 49-134960

Int. Cl.² H04N *5/14*; **H03K** *5/20*

U.S. Cl. 358—167 **7 Claims**



1. A noise reducing circuit for video signals comprising:

an input circuit including an active element having first, second and third electrodes, said first electrode being for receiving a video signal including high and low frequency components accompanied with noise;

a high-pass filter connected with said second electrode of said active element for deriving the high frequency components of said video signal and a low-pass filter connected with said third electrode of said active element for deriving the low frequency components of said video signal, said high-pass filter and low-pass filter serving as first and second loads on said active element with respect to said high and low frequency components of the received video signal on said first electrode of said active element respectively;

a noise eleminating means including a voltage source and a switching circuit connected between said voltage source and said high-pass filter, the junction point between said switching circuit and said high-pass filter being connected with said second electrode of said active element, whereby said switching circuit is rendered conductive to make the potential on said second electrode substantially constant when the output of said high-pass filter, derivable on said second electrode of said active element, has an amplitude smaller than a predetermined value and is rendered non-conductive when said output derivable on said second electrode has an amplitude not smaller than said predetermined value; and

means for adding the output of said low-pass filter to the output of said high-pass filter under control of said noise eliminating means, thereby reproducing a noise-suppressed video signal.

4,031,548

PLURAL RECEIVING AND RECORDING TELEVISION SYSTEM

Yoshiro Kato, Fujisawa, and Choichi Fujita, Machida, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 25, 1975, Ser. No. 616,667

Claims priority, application Japan, Sept. 30, 1974, 49-112534

Int. Cl.² H04N *5/44*, *5/76*

U.S. Cl. 358—188 **2 Claims**

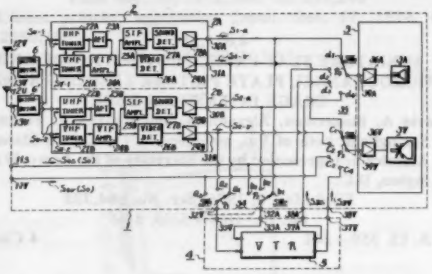
1. A television system comprising the combination of:

A. signal recording and/or reproducing apparatus having input and output terinals; and

B. a television receiver comprising:

1. a pair of signal selecting and receiving circuitries, each including at least a separately tunable tuner, a video intermediate frequency amplifier, a video detector, and a sound detector,

2. a display stage including sound and video reproducing circuits,
3. first switching means for selectively connecting one of said pair of signal selecting and receiving circuitries to the input terminal of said recording and/or reproducing apparatus, and



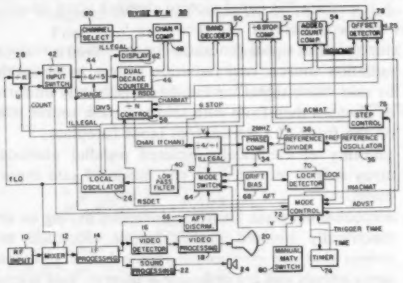
4. second switching means for selectively connecting one of said pair of signal selecting and receiving circuitries and the output terminal of said recording and/or reproducing apparatus to said display stage.

4,031,549

TELEVISION TUNING SYSTEM WITH PROVISIONS FOR RECEIVING RF CARRIER AT NONSTANDARD FREQUENCY

Robert Morgan Rast, Mercerville; Charles Martin Wine, and John Goodchilde Norie Henderson, both of Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,521
Int. Cl.² H04N *5/50*; H04B *1/26*
U.S. Cl. 358—193 **14 Claims**



1. Apparatus for tuning a receiver to a selected channel, comprising:

input means for receiving an information bearing radio frequency carrier;

local oscillator means for generating a local oscillator signal;

mixer means for combining said radio frequency carrier and said local oscillator signal to derive an intermediate frequency information bearing carrier;

first means for tuning the frequency of said local oscillator signal to the nominal local oscillator frequency allocated to said selected channel;

second means for tuning said local oscillator signal to minimize a deviation between the frequency of said intermediate frequency carrier and a nominal intermediate frequency carrier;

control means for selectively coupling either said first means or said second means to said local oscillator, said control means initially coupling said first means to said local oscillator means when said selected channel is selected;

lock detection means for generating a lock signal when said means has substantially tuned the frequency of said local oscillator signal to said nominal local oscillator frequency, said control means coupling said second means to said local oscillator means in response to said lock signal;

offset detection means for generating an offset signal when the frequency of said local oscillator signal is more than a predetermined offset from the frequency of said local oscillator signal generated when said first means was coupled to said local oscillator, said control means coupling said first means to said local oscillator means in response to said offset signal; and

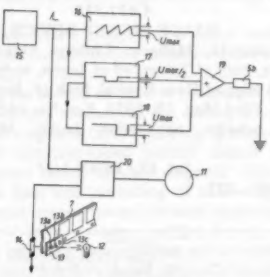
means coupled to said first means for generating a step signal in response to said offset signal, said first means tuning the frequency of said local oscillator signal to a frequency differing by an incremental amount from the frequency of said local oscillator signal during the initial interval in which said local oscillator means is under the control of said first means.

4,031,550

FILM SCANNER

Richard Wick, Munich; Friedrich Bestenreiner, Grunwald; Reinhold Deml, and Josef Helmberger, both of Munich, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Continuation of Ser. No. 384,396, Aug. 1, 1973, which is a continuation of Ser. No. 162,373, July 14, 1971, abandoned. This application Feb. 25, 1976, Ser. No. 661,333
Claims priority, application Germany, July 18, 1970, 2035820
Int. Cl.² H04N *3/36*
U.S. Cl. 358—216 **4 Claims**



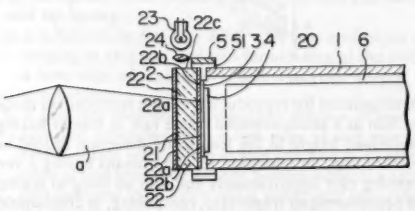
1. Arrangement for reproducing images recorded on motion picture film at a predetermined frame rate in frames having a predetermined height in the lengthwise direction of said motion picture film, on television receiver means having a vertical scanning rate approximately equal to an integral multiple of said predetermined frame rate, comprising, in combination, moving means for moving said motion picture film continuously along a predetermined path across a predetermined scanning region; scanning means for scanning each of said frames of said film a first, second and third time over said scanning region during said movement of said frames along said predetermined path, thereby furnishing scanning signals constituting a first, second and third scan, said scanning means including a cathode ray tube for furnishing a light beam and a screen, said scanning means further comprising lens means for focussing said screen onto said frames, and photoreceiver means positioned behind said film in the direction of propagation of said light, the height of said screen exceeding the

height of said image of said screen on said frames by one-third; and scan control means connected to said scanning means for deflecting said light over a region corresponding to half of said screen height for each of said scans and for changing the position of said scanning region by one-third of said image height along said predetermined path following completion of said first scan and following completion of said second scan, said scan control means comprising multivibrator means and sawtooth voltage generator means for furnishing voltages deflecting said light from an initial position to a maximum deflection in a first direction during said first scan, deflecting said light to a position corresponding to one-half the maximum deflection in the opposite direction at the start of said second scan, deflecting said light to a position corresponding to one-half of said maximum deflection in said first direction during said second scan, deflecting said light to a value corresponding to said maximum deflection in said opposite direction at the beginning of said third scan and back to said initial position at the end of said third scan; wherein said motion picture film has perforations having a predetermined spatial relationship to each of said frames; further comprising photosensitive means for furnishing location signals in response to light passing through said perforations during movement of said film along said predetermined path; and synchronizing means for furnishing synchronizing signals for synchronizing said scan control means to said moving means at least in part in dependence upon said location signals.

4,031,551
IMAGE PICKUP DEVICE

Saburo Nobutoki, Mobara; Chihaya Ogusu, and Masao Sugimoto, both of Tokyo, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of, Japan

Filed Mar. 19, 1976, Ser. No. 668,401
Claims priority, application Japan, Mar. 22, 1975, 50-33541
Int. Cl.² H04N *5/21*
U.S. Cl. 358—223 **10 Claims**



1. An image pickup device having a photoconductive type image pickup tube comprising:

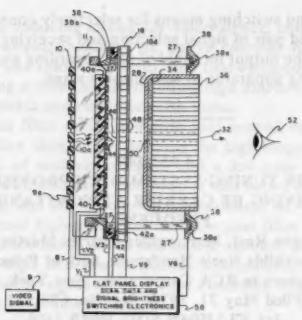
a. a face plate disposed at one end of an envelope and consisting of an effective image pickup region at the central portion thereof and an ineffective image pickup region at the peripheral portion thereof including the edge of the face plate, at least a portion of said ineffective image pickup region being light-dispersive; and

b. means including at least one light source for introducing light solely into said light-dispersive portion of said ineffective image pickup region, said introduced light being dispersed by said portion and projected as bias light into said effective image pickup region.

4,031,552
MINIATURE FLAT PANEL PHOTOCATHODE AND MICROCHANNEL PLATE PICTURE ELEMENT ARRAY IMAGE INTENSIFIER TUBE

David A. Bosserman, Alexandria, and Charles F. Freeman, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 5, 1976, Ser. No. 664,325
Int. Cl.² H04N *5/70, 5/66*
U.S. Cl. 358—241 **4 Claims**



1. A miniature flat panel picture element array image intensifier tube comprising:

a video picture signal generator for providing a video signal;

a radiation source, said radiation source being modulated by said video signal for creating a generally uniform flow of photons therefrom with said radiation source mounted on the front of a transparent input faceplate;

a plurality of electrically isolated parallel photocathode array stripes mounted on the inside of said input faceplate;

a microchannel plate electron multiplier having an array of electrically isolated parallel input electrode metallic stripes that are positioned adjacent said photocathode array stripes and are orthogonal thereto, said microchannel plate having a continuous metallic output electrode;

an array switching electronic means for switching bias voltages in some selected scan mode over individual stripes of said photocathode array and over said array of microchannel plate input electrode metallic stripes for selectively providing proximity focus areas between cross-over stripes that have on bias voltages applied thereto and wherein repressive voltages exist on all other cross-over stripes that have off bias voltages applied thereto wherein photoelectrons emitted from said photocathode array stripes conform to a charge pattern swept through the proximity focus areas according to said scan mode; and

a metallized phosphor screen mounted on the inside of a transparent output faceplate wherein said metallized phosphor screen is adjacent said microchannel plate output electrode for converting electrons from said microchannel plate into visible energy on said metallized phosphor screen for producing a visible image of said video signal according to said scan mode.

4,031,553
IMPLOSION-RESISTANT CATHODE RAY TUBE WITH PROTECTIVE ASSEMBLY FOR ITS FACE PLATE

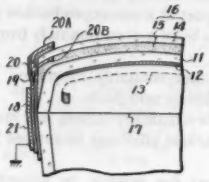
Hiroji Sumiyoshi, Sagamihara, and Tomosuke Chiba, Matsudo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 25, 1975, Ser. No. 635,240

Claims priority, application Japan, Dec. 17, 1974, 49-152750[U]

Int. Cl.² H04N 5/65

U.S. Cl. 358—247 **6 Claims**



1. A cathode ray tube comprising an envelope having a face plate, a conductive reinforcing band girdling said envelope adjacent said face plate, a transparent protective panel covering the outer surface of said face plate and being spaced from the latter, a transparent conductive adhesive resin filling the space between said face plate and said panel to cooperate with the latter in protecting said face plate and adhesively joining said panel to said face plate, and at least one conductive connecting element providing an electrically conductive connection between said conductive material and said band.

4,031,554
MAGNETIC RECORDING AND REPRODUCING APPARATUS

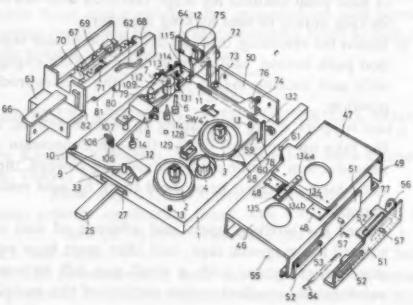
Tomoyoshi Umeda, and Yoshimasa Haraguchi, both of Tokyo, Japan, assignors to Beltek Corporation, Tokyo, Japan

Filed Aug. 19, 1975, Ser. No. 605,924

Claims priority, application Japan, Sept. 13, 1974, 49-105563

Int. Cl.² G11B 5/54, 15/46, 19/24

U.S. Cl. 360—73 **7 Claims**



1. A magnetic recording and reproducing apparatus comprising:

a substrate;

a tape pack inserting container having a space therein for receiving a tape deck and being supported over said substrate in a manner to be movable between a lower recording or playback position and an upper recording or playback stand-by position;

container actuating mechanism means for moving said container vertically between said upper and lower positions in relation with loading and ejection of said tape pack;

container supporting means for stably supporting both opposite lateral sides of said container in both said lower position and said upper position thereof as well as during movement thereof between said positions;

a head plate supported to be movable between a recording or playback position and a recording or playback stand-by position;

spring member means for constantly biasing said head plate toward said recording or playback position;

head plate actuating means for moving said head plate to said recording or playback position by utilizing the force of said spring member means or to said recording or playback stand-by position against the force of said spring member means, as a function of said container actuating mechanism means and in response to movement of said container to said recording or playback position or said recording or playback stand-by position thereof;

a track scanning head supported by said head plate;

a pair of rotatable reel rest means for taking up a magnetic tape of said tape deck in the forward or reverse directions thereof;

an assembly including a single capstan and a single pinch roller for causing said magnetic tape to travel in both said forward or reverse directions thereof, depending on the direction of rotation of said single capstan and single pinch roller;

a single idler located approximately midway between said pair of reel rest means;

movable support plate means, rotatably and slidably supporting thereon said single idler, for moving said single idler into contact with a selected either one of said reel rest means to transfer the driving force of said single idler to said one reel rest means;

a puller maintained in pressing contact with said single idler to provide said single idler with normal or reverse rotative force around the axis thereof and around said pulley;

a single motor;

means for transferring rotation of said single motor to said single capstan and to said single idler through said pulley; and

a control circuit system comprising a motor constant-speed control circuit for controlling constant-speed drive of said magnetic tape, a motor normal-reverse control circuit for controlling the normal or reverse rotation of said motor, a single switching mechanism for, during constant-speed travel of the magnetic tape, supplying operation signals to said motor constant-speed control circuit to achieve constant-speed travel of said magnetic tape, and for, during fast feed and rewinding of said magnetic tape, actuating said motor normal-reverse control circuit to achieve rapid drive of said motor, and directly controlling the driving of motor through said motor normal-reverse control circuit, thereby causing normal or reverse drive of said motor, and thus enabling fast feed or rewinding operation of magnetic tape.

4,031,555
REEL-TO-REEL TAPE TO TAPE CARTRIDGE ADAPTER

Theodore R. Hughes, 28 S. Kingston, Tulsa, Okla. 74112, and Glenn L. McCarty, 6319 S. 45 W. Ave., Tulsa, Okla. 74132

Filed Oct. 20, 1975, Ser. No. 623,820

Int. Cl.² G11B 5/78, 15/66, 23/04

U.S. Cl. 360—94 **4 Claims**

1. In combination with a conventional magnetic tape player adapted to receive and play a tape cartridge carrying magnetic tape, said cartridge having selected physical and geometric characteristics, said player including:

an aperture for receiving said tape cartridge;

means in said player for driving a transport means for said tape in said tape cartridge;

magnetic head means for contacting and interacting with the magnetized surface of said tape in said cartridge;

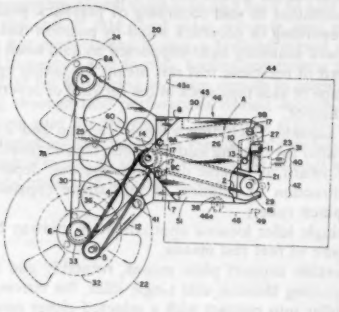
amplifier and speaker means for utilizing the electrical signals generated in said magnetic head means;

the improvement in apparatus for adapting said player for playing a non-cartridge type reel-to-reel tape of the type wherein the reels are completely independent elements, comprising:

a. frame means having two principal parts;

1. a first frame means having substantially the same exterior characteristics as said tape cartridge; and adapted to be received in said aperture like said tape cartridge;

2. second frame means for indepently supporting a take up reel and a storage reel, said storage reel carrying



a tape to be played in said player, said second frame means adapted to be disposed on the outsideof said player when said first frame means is inserted into said player whereby both of said reels are accessible;

b. means for driving said take up reel, which when said first frame is inserted into said player, is responsive to said means for driving in said player;

c. means in said first frame means for guiding said tape from said storage reel through said first frame means and past a first aperture in the front end of said first frame means similar to the path of the tape and the aperture in said tape cartridge; and then to said take up reel;

whereby when said first frame is inserted into said player, said tape will be in operating relation to said magnetic head means.

4,031,556

MODE CHANGEOVER APPARATUS FOR RECORDER/PLAYER

Itsuki Ban, 829, Higashioizumi, Nerima, Tokyo, and Kazunori Mochizuki, 6673 Oazahodaka, Hodaka-cho, Minamiazumi, Nagano, both of Japan

Filed Apr. 14, 1976, Ser. No. 676,892

Claims priority, application Japan, Apr. 14, 1975, 50-44270; May 2, 1975, 50-52520; June 26, 1975, 50-78640

Int. Cl.[2] G11B *15/10, 15/24, 15/44, 23/04*

U.S. Cl. 360—96 **28 Claims**

1. An improvement in a mode changeover apparatus for a magnetic recorder/player of the type which includes means for moving, along a surface of a deck provided in the main body of the recorder/player, a support carrying a magnetic head and the like toward and away from a magnetic tape set in the recorder/player, a spring for elastically biasing said suppot in one direction, reproduction push-botton means for effecting reproducing mode, push-button means for effecting respective modes of stop, fast-feed and rewind, an alternative-selection mechanism for alternatively locking some of said push-button means in position and releaving others of said push-button means from locking engagement when one of said modes is effected, reel driving means for driving, through depression of said fast-feed push-button, a take-up reel-shaft at a high speed, and driving, through depression of said rewind push-button, a supply reel-shaft at a high speed in a reverse direction, and means for shutting off, through depression of said stop push-button, power supply to a motor for capstan power means, the improvement comprising:

a. restraining means for restraining against the elastic force of said spring said support to a reproduction position when said support has been moved near to the magnetic tape;

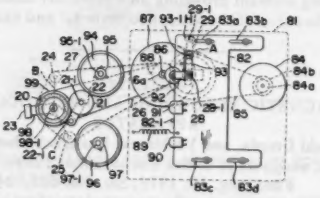
b. locking means for locking against the elastic force of said spring said support at a non-reproduction position where said support has been moved remotely from the magnetic tape;

c. an eccentric idler rotatably supported by a movable member provided to said deck;

d. spring means for elastically biasing said movable member in a manner that said idler may be rotated by said capstan power means;

e. engaging means for making, in accordance with the movement of said movable member, engagement with said support to move said support to the non-reproduction position;

f. locking member for locking said movable member at a point where a portion of the periphery of said idler having substantially smallest radius with respect to the rotating axis of said idler confronts said capstan power means;



g. means for temporarily relieving, through depression one of said push-buttons for stop, fast-feed and rewind, the locking action of said locking member;

h. means for releasing, through depression of said reproduction push-button, said support from locking engagement with said locking means made at the non-reproduction position;

i. said support, along with taking up of the magnetic tape by the take-up reel-shaft driven through depression of said reproduction push-button, advancing toward the magnetic tape and then being held there by said restraining means;

j. means for holding, upon said advance of said support toward the magnetic tape, said idler apart from said capstan power means with a small gap left between said substantially smallest radius portion of the periphery of said idler and said capstan power means; and

k. whereby said idler, through depression of any one of said push-bottons for stop, fast-feed and rewind, rotating and then being locked by said locking means in a manner that a portion of the periphery of said idler having substantially largest radius with respect to its rotating axis confronts said capstan power means, and the take-up reel-shaft, through depression of said fast-feed push-button, being rotated at a high speed, and the supply reel-shaft, through depression of said rewind push-button, being rotated at a high speed in reverse direction.

4,031,557

CASETTE LOADING DEVICE FOR USE IN MAGNETIC SOUND RECORDING AND PLAYING BACK APPARATUS

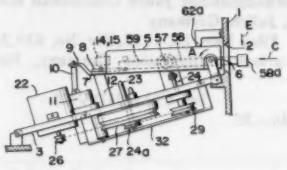
Itsuki Ban, 829, Higashi, Ohizumi, Nerima, Tokyo, and Kazunori Mochizuki, 6673, Ohaza Hodaka, Hodakamachi, Minamiazumi, Nagano, both of Japan

Filed Aug. 4, 1975, Ser. No. 601,437

Claims priority, application Japan, Aug. 2, 1974, 49-87996; Aug. 2, 1974, 49-87995

Int. Cl.² G11B *15/00, 5/54*

U.S. Cl. 360—96 **6 Claims**



1. A cassette loading device for use in magnetic sound recording and playing back apparatus comprising a chassis mounted on the inner side of the front panel of the holder of the apparatus, said chassis inclining downwardly; a capstan for driving a magnetic tape and reel supporting platforms mounted on said chassis; a cassette holder having a bottom plate and being mounted on said chassis to be rotatable about an axis perpendicular to the direction of insertion of a cassette containing said magnetic tape into said cassette holder, said cassette holder being provided with a cassette insertion opening confronting the cassette insertion opening provided for said front panel; spring means for biasing said cassette holder to rotate downwardly; a cassette detection lever mounted near the inner end of said cassette holder so as to be rotated a predetermined angle by said cassette when it is inserted completely; a stop member mounted on said chassis, the upper surface of said stop member cooperating with said cassette detection lever before completion of the insertion of said cassette thereby maintaining said cassette holder in the horizontal position against the biasing force of said spring means; and an operating lever mounted on the bottom plate of said cassette holder to be slidable in the direction of insertion of said cassette, said operating lever including a portion extending in parallel with the inner edge of said cassette holder, a magnetic head and a pinch roller mounted on said portion, and spring means for biasing said operating lever to pull said portion toward said cassette holder.

4,031,558

HEAD DRUM ASSEMBLY WITH ELECTRICAL NOISE SHIELD

Satoru Kusaka, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

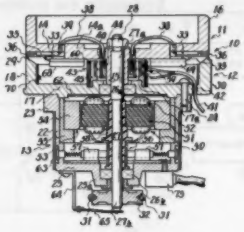
Filed Aug. 11, 1975, Ser. No. 603,538

Claims priority, application Japan, Aug. 27, 1974, 49-98105

Int. Cl.² G11B *15/60, 5/52, 21/04*

U.S. Cl. 360—130 **11 Claims**

1. A head drum assembly for a video tape transport apparatus, a grounded stationary drum member; a rotary drum member coaxial with said stationary drum member and cooperating with the latter to define a peripheral guide surface for a magnetic tape with a circumferential gap in said guide surface between said stationary and rotary drum members; at least one magnetic head fixed to said rotary drum member and extending into said gap for transducing video signals on a magnetic tape guided by said peripheral guide surface; a D.C. motor disposed coaxially in respect to said stationary and rotary drum members and having a rotary shaft directly coupled to said rotary drum member for effecting rotation of the latter; signal transformer means including nested annular outer stationary and inner rotary cores which are fixed to, and coaxial with said stationary and rotary drum members, respectively, and adjacent stationary and rotary windings mounted on said stationary and rotary cores, respectively; means connecting said magnetic head to said rotary winding; signal conducting means connected to said stationary winding; and shielding means comprising a material of high magnetic permeability extending around said outer surface of said stationary core and having a layer of good electrical conductivity superimposed on said high permeability material and electrically connected to said grounded stationary drum member for shielding said signal transformer means from electrical signals noise generated by said D.C. motor.



4,031,559

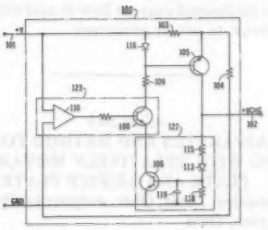
FILTER CAPACITOR CHARGING CIRCUIT

Daniel Vern Peters, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 10, 1975, Ser. No. 639,396

Int. Cl.² H02H *9/04*

U.S. Cl. 361—52 **6 Claims**



1. A circuit for charging an input filter capacitance from a source of potential having a battery terminal and a ground terminal comprising:

an input connected to the battery terminal, and an output for connection to the capacitance;

a first charging circuit comprising two resistors connected in series between said input and said output;

a threshold detecting circuit comprising first semiconductor switching means connected to said ground terminal and having an output terminal and a control terminal, and diode means connected between said output and said control terminal of said first semiconductor switching means;

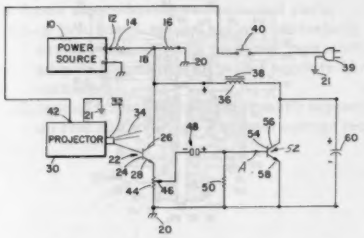
a second charging circuit comprising second semiconductor switching means connected between the junction of said two resistors and said output and having a control terminal, and diode means interconnecting said battery terminal and said control terminal of said second semiconductor switching means; and

means for coupling said output terminal to said control terminal of said second semiconductor switching means.

4,031,560
CHOPPED LIGHT RELAY KEYER

Richard L. Maresh, R.R. No. 2, Syracuse, Ind. 46567

Filed Nov. 19, 1975, Ser. No. 633,294
Int. Cl.² H01H 47/24
U.S. Cl. 361—175 10 Claims

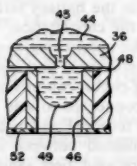


9. A protective circuit for a projector having a sequentially framed light energy output comprising a phototransistor having a base, collector, and emitter; said base being subject to the output of the projector and being biased thereby to cause conduction between said emitter and said collector at a rate corresponding to said sequential frame occurence; a transistor having a base, collector, and emitter; a transistor emitter-collector circuit; a relay coil being coupled in said transistor emitter collector circuit; a capacitor being coupled across said transistor emitter and collector; a power source being coupled across said relay and capacitor whereby said power source will charge said capacitor through said relay when said transistor is non-conductive; a differentiating circuit being coupled between said phototransistor emitter and said transistor base whereby a spike signal will be generated and applied to said transistor base when said phototransistor conducts; a power circuit for applying power to the projector; a relay contact switch in said power circuit responsive to current flow in said relay coil to close said power circuit to said projector and responsive to attenuated current flow in said relay coil to open the power circuit to power projector.

4,031,561
STARTUP APPARATUS AND METHOD FOR JET DROP RECORDING WITH RELATIVELY MOVABLE CHARGE PLATE AND ORIFICE PLATE

Suresh C. Paranjpe, Xenia, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed May 3, 1976, Ser. No. 682,363
Int. Cl.² G01D 15/18
U.S. Cl. 346—1 22 Claims



15. In a jet drop recording head having a jet forming nozzle and a circular charging electrode spaced apart from said nozzle, the method of starting a flow of recording liquid through said nozzle comprising the steps of:

placing said electrode in liquid resisting proximity to said nozzle,

after aforesaid placement introducing a flushing liquid into said recording head and forcing it through said nozzle and electrode to form a liquid jet,

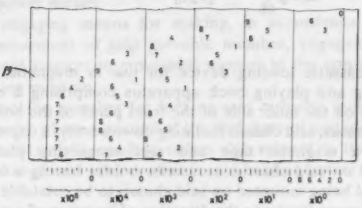
introducing recording liquid into said recording head to replace said flushing liquid in said jet, and

retracting said electrode to an operating position spaced apart from said nozzle and surrounding said jet.

4,031,562
DEVICE FOR CREATING A DISPLAY OF A VARIABLE, THE VALUE OF WHICH IS DIGITALLY ENCODED

Horst Holzbrecher, Jülich-Bourheim, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Nov. 12, 1975, Ser. No. 631,380
Claims priority, application Germany, Nov. 13, 1974, 2453752
Int. Cl.² G01D 9/06
U.S. Cl. 346—35 3 Claims

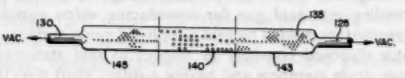


1. An apparatus for developing a printed display of a variable transformed into a digital voltage or current signal while a digital signal is so coded in a code adapted to a predetermined numerical system and consists of digital individual signals which correspond to groups of a predetermined numerical system which comprises in combination: means for measuring instantaneous values of the variable and for encoding the signals thus developed in a binary code in which individual signals correspond to differently valued groups of a numerical system, and a type printing mechanism including means establishing operative connection with said means for measuring instantaneous values of the variable and for encoding the signals thus developed in the binary code to receive the encoded signals in conformity with the respective group, said mechanism being operable to register and display the values corresponding to the respective groups in adjacent relation in a sequence corresponding to the value of the groups and also corresponding to the values within each group, said printing mechanism comprising a plurality of printing heads, each having numerals thereon distributed circumferentially of the respective head, each head being rotatable individually, and means for rotating the heads in conformity with the value to be printed thereby.

4,031,563
JET DROP RECORDING HEAD HAVING AN IMPROVED POROUS DEFLECTION RIBBON

Suresh C. Paranjpe, Xenia, and Daniel W. Moore, Dayton, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 29, 1976, Ser. No. 653,597
Int. Cl.² G01D 15/16
U.S. Cl. 346—75 5 Claims



1. A self-cleaning deflection ribbon assembly for use in a jet

drop recording head having means for generating a plurality of drop streams, each stream consisting of a series of liquid recording drops, means for selectively charging said drops, and a source of drop deflecting potential, comprising:

a porous deflection ribbon having an electrically conductive surface defining a plurality of liquid ingesting pores, the total cross-sectional area of said pores per unit area of said ribbon varying progressively from a smaller value at a point adjacent a first end of said ribbon to larger values at points further removed therefrom,

means for connecting the source of drop deflecting potential to said electrically conductive surface, and

means for applying an evacuating suction of said first end of said ribbon, wherein variations in drop ingesting effectiveness due to variations in evacuating suction along the extent of the ribbon are minimized.

DESIGN PATENTS

GRANTED JUNE 21, 1977

ERRATA

For CLASS	See PATENT NO.
010–038	244,761
010–075	244,762
010–098	244,763
010–113	244,764
011–040	244,765
011–089	244,766
011–137	244,767
011–149	244,768
012–062	244,769
012–142	244,770
012–193	244,771
012–215	244,772
014–099	244,778
014–012	244,779
012–012	244,780
014–039	244,781
014–075	244,799
014–005	244,800
014–082	244,801
024–002	244,805

DESIGN PATENTS

GRANTED JUNE 21, 1977

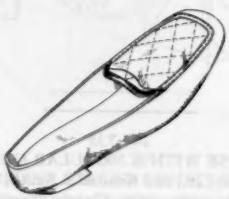
ERRATA

Class	Des. Patent No.
010-032	244,761
010-073	244,762
010-098	244,763
010-113	244,764
011-040	244,765
011-089	244,766
011-127	244,767
011-149	244,768
012-082	244,769
012-142	244,770
012-193	244,771
012-215	244,772
014-099	244,773
014-012	244,774
013-012	244,775
014-039	244,776
014-075	244,777
014-093	244,778
014-092	244,779
024-002	244,780

DESIGNS

JUNE 21, 1977

244,726
POCKET-TOP SHOE
Marcella M. Katz, 10573 Le Conte Ane., Los Angeles, Calif., 90024
Filed Dec. 31, 1975, Ser. No. 645,542
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—265



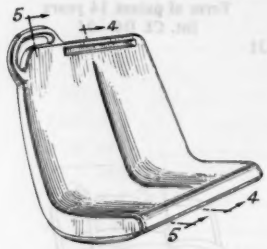
244,727
SHOE
Ambrogio Borri, Piazza della Repubblica 21, Milan, Italy
Filed Apr. 16, 1975, Ser. No. 568,512
Claims priority, application Italy, Oct. 16, 1974, 22161/74
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—287

244,728
DUAL HANDLED HAIR BRUSH
Diane I. Kael, 16300 N. Park Drive, Apt. 805, Southfield, Mich. 48075
Filed Apr. 19, 1976, Ser. No. 677,903
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—31

244,729
SWIVEL CHAIR
Randall P. Buhk, Wyoming, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.
Filed Sept. 5, 1975, Ser. No. 610,834
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

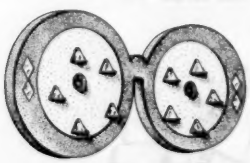
244,730
CHAIR
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Division of Ser. No. 630,321, Nov. 10, 1975, Pat. No. Des.241,695. This application June 10, 1976, Ser. No. 694,777
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

244,731
BUS SEAT
Norman J. James, Bonita; Larry G. Hickey, Chula Vista, and Fred Powers, San Diego, all of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.
Filed Mar. 19, 1976, Ser. No. 668,483
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48

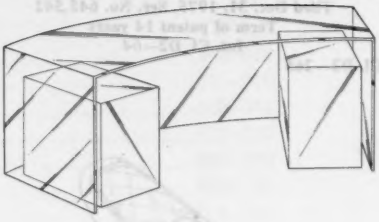


244,732
CHAIR
Vittorio Introini, Gallarate, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy
Filed Mar. 18, 1975, Ser. No. 559,447
Claims priority, application Italy, Sept. 20, 1974, 60922/74
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—76

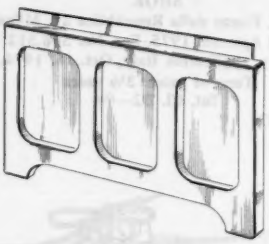
244,733
EYEGLASS DISPLAY RACK INCLUDING ROTARY DISKS
Italo Tammera, 7 Cliff St., West Orange, N.J. 07052
Filed Feb. 20, 1976, Ser. No. 659,593
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—136



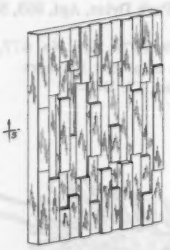
244,734
DESK
Eric Laroye, Koningstraat 14 -Bus 2-, 8400 Oostende, Belgium
Filed June 12, 1975, Ser. No. 586,337
Claims priority, application Belgium, Dec. 20, 1974, 60081
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—175



244,735
PANEL FOR USE WITH A MODULAR COUNTER UNIT
Robert J. Kennedy, Jr., and Kendall S. Smith, II, both of West Lafayette, Ind., assignors to Lincoln Manufacturing Company, Inc.
Filed Sept. 17, 1975, Ser. No. 614,337
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—193

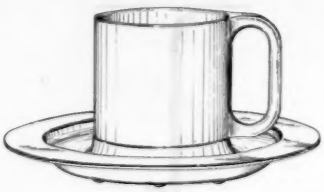


244,736
CABINET DOOR PANEL
James J. Palka, Arlington Heights, Ill., assignor to General Bathroom Products Corporation, Elk Grove Village, Ill.
Filed Mar. 15, 1976, Ser. No. 666,749
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—193

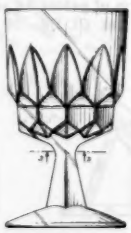


244,737
WARDROBE SYSTEMIZER DEVICE
Franklin H. Henry, 1431 Prentice Drive, Healdsburg, Calif. 95448
Filed Dec. 22, 1975, Ser. No. 642,726
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—257

244,738
CUP AND SAUCER COMBINATION
Sven-Eric Juhlin, Ingaro, Sweden, assignor to Aktiebolaget Gustavsbergs Fabriker, Gustavsberg, Sweden
Filed Mar. 9, 1976, Ser. No. 665,303
Claims priority, application Sweden, Sept. 24, 1975, 751871
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—3

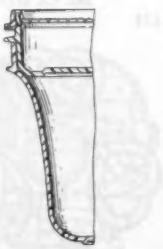


244,739
WINE GLASS OR SIMILAR ARTICLE
Philippe J. Durand, 62510 Arques, LaGarenne, France
Filed Dec. 30, 1975, Ser. No. 645,460
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13

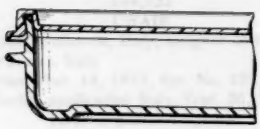


244,740
TUMBLER OR SIMILAR ARTICLE
Philippe J. Durand, 62510 Arques, LaGarenne, France
Filed Dec. 30, 1975, Ser. No. 645,459
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—14

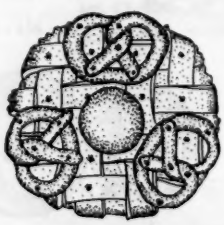
244,741
COVERED COMPARTMENTED BOWL
Robert H. C. M. Daenen, Aalst, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Sept. 10, 1975, Ser. No. 612,154
The portion of the term of this patent subsequent to May 24, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—17



244,742
COVERED SERVING BOWL OR THE LIKE
Robert H. C. M. Daenen, Aalst, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 23, 1976, Ser. No. 651,863
The portion of the term of this patent subsequent to Apr. 19, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—17



244,743
CANISTER LID
Wendy P. Turner, 3901 E. Garden Lane, Littleton, Colo. 80121
Filed June 4, 1975, Ser. No. 583,840
Term of patent 3½ years
Int. Cl. D7—*01*
U.S. Cl. D7—131

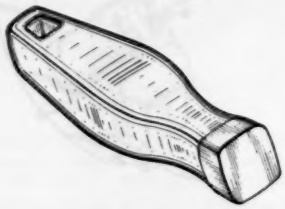


244,744
DETACHABLE GRASS SHEAR HEAD FOR CORDLESS TOOL
Roderick Francis Bunyea, Cockeysville, Md., assignor to The Black and Decker Manufacturing Company
Filed Aug. 19, 1975, Ser. No. 605,859
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8

244,745
TORQUE WRENCH
Hiroshi Tsuji, Tokyo, Japan, assignor to Tohnichi Manufacturing Co. Ltd., Japan
Filed Dec. 19, 1975, Ser. No. 642,392
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—24

244,746
JIG FOR CUTTING TILE
Leonard C. Stabb, 10137 Catalina Drive, Indianapolis, Ind. 46236
Filed Mar. 3, 1976, Ser. No. 663,241
Term of patent 14 years
Int. Cl. D8—99
U.S. Cl. D8—71

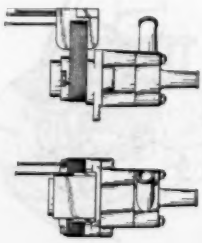
244,747
HANDLE FOR TOOLS
Johannes Josef Solf, Sindelfingen-Eichholz, Germany, assignor to Friedr. Dick G.m.b.H., Esslingen, Germany
Filed Dec. 31, 1975, Ser. No. 645,654
Claims priority, application Germany, July 18, 1975, 831221
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—107



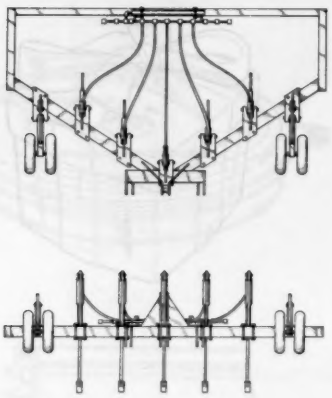
244,748
BRACKET FOR MOUNTING ACCESSORIES OVER THE TRANSMISSION HUMP OF A VEHICLE
Robert W. Canterbury, Addison, Tex., assignor to Holly Enterprises, Addison, Tex.
Filed Feb. 19, 1976, Ser. No. 659,491
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—380

244,749
RIBBON CONTAINER
Dale R. Hodges, 4103 Inwood Road, Dallas, Tex. 75209
Filed July 28, 1975, Ser. No. 599,475
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—238

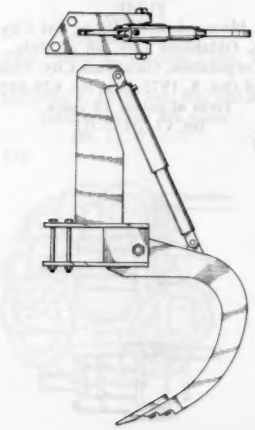
244,750
PUMP
Leo L. Roberts, Moore; Lee W. Davis, Del City, and Jim S. Hollingsworth, Oklahoma City, all of Okla., assignors to Little Giant Corporation, Oklahoma City, Okla.
Filed Oct. 8, 1975, Ser. No. 620,888
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



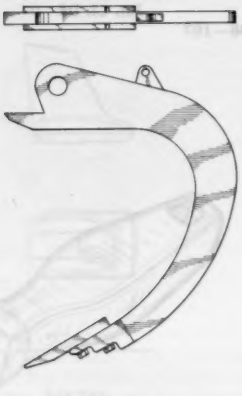
244,751
HYDRAULIC RESET GROUND RIPPER IMPLEMENT
Glen A. Watts, Rte. 1, Box 258, McMinnville, Oreg. 97128
Filed Mar. 8, 1976, Ser. No. 664,491
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—11



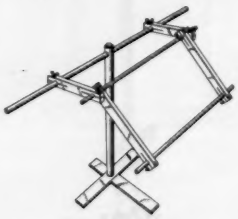
244,752
COMBINED GROUND RIPPER TOOTH AND HYDRAULIC RESET ASSEMBLY
Glen A. Watts, Rte. 1, Box 258, McMinnville, Oreg. 97128
Filed Mar. 8, 1976, Ser. No. 664,492
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29



244,753
GROUND RIPPER TOOTH
Glen A. Watts, Rte. 1, Box 258, McMinnville, Oreg. 97128
Filed Mar. 8, 1976, Ser. No. 664,493
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29

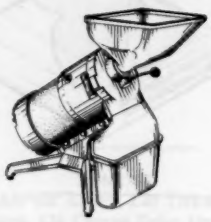


244,754
PORTABLE ADJUSTABLE STAND FOR A NEEDLEWORK FRAME
Donald I. Bard, 7901 College Lane, Annandale, Va. 22003
Filed Mar. 26, 1976, Ser. No. 670,812
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—66

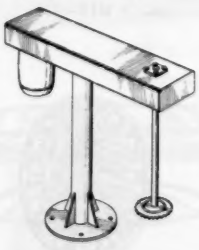


244,755
PORTABLE ADJUSTABLE STAND FOR SUPPORTING AN EMBROIDERY HOOP
Donald I. Bard, 7901 College Lane, Annandale, Va. 22003
Filed Mar. 26, 1976, Ser. No. 670,813
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—66

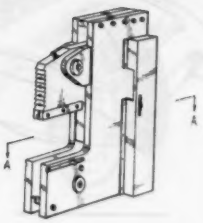
244,756
GRAIN MILL
Clarence E. Granzow, 2516 E. Jackson St., Phoenix, Ariz. 85034
Filed June 28, 1976, Ser. No. 700,592
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—98



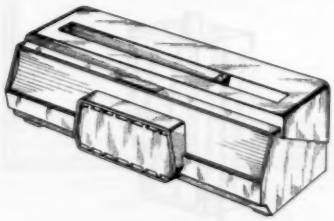
244,757
DISPERSING APPARATUS
Donald M. Schnear, Corona del Mar, Calif., assignor to Morehouse Industries, Inc., Fullerton, Calif.
Division of Ser. No. 515,203, Oct. 16, 1974, Pat. No. Des. 241,675. This application Nov. 17, 1975, Ser. No. 632606
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—122



244,758
METAL FORMING PRESS
Dugmore Dennis Slattery, 177 Kestell Street, Potgietersrus, Transvaal Province, South Africa
Filed Mar. 3, 1976, Ser. No. 663,379
Claims priority, application South Africa, Sept. 8, 1975, 75/1298
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—123

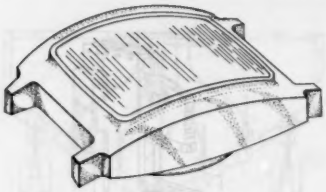


244,759
APPLIANCE FOR CUTTING, SEALING AND MAKING PLASTIC BAGS
William B. Kindred, Allen Park, Mich., assignor to Weigl Co., Inc., New York, N.Y.
Filed July 12, 1976, Ser. No. 704,370
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—146

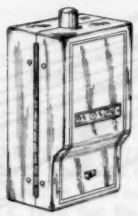


244,760
ROTARY ENGINE MODEL
Ronald L. Phillips, 4633 Dow Ridge, Orchard Lake, Mich. 48033
Filed Mar. 24, 1975, Ser. No. 561,109
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

244,761
DIGITAL WRIST WATCH
Eugene Joseph Sulek, 3725 Buckboard, Plano, Tex. 75074
Filed Sept. 11, 1975, Ser. No. 612,616
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

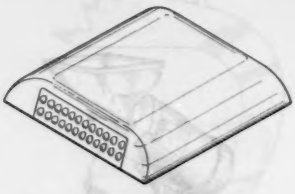


244,762
ELECTRICAL LEAKAGE ANALYZER
Roger K. F. Wasmer, 410 Ridgewood Drive N., Bellevue, Nebr. 68005; David W. McCord, 4811 Florence Blvd., Omaha, Nebr. 68110, and Anthony J. Graziano, 2110 Georgia Ave., Bellevue, Nebr. 68005
Filed June 9, 1975, Ser. No. 584,695
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—75

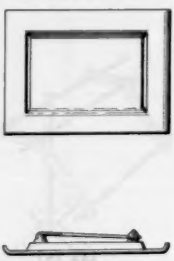


244,763
SPEEDOMETER
Philip S. Stefaniak, Evanston, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Dec. 18, 1975, Ser. No. 641,985
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—98

244,764
ROAD-TRAFFIC STUD
Emil Grubauer, Wattens, Austria, assignor to D. Swarovski & Co., Wattens, Austria
Filed Sept. 12, 1975, Ser. No. 612,672
Claims priority, application Austria, Mar. 18, 1975, 11495/75
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—113



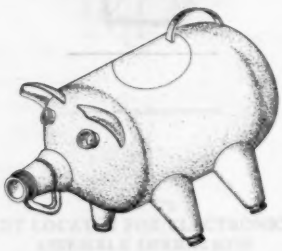
244,765
JEWELRY PIN FOR DISPLAY OF PHOTOGRAPHIC NEGATIVE CONTACT PRINTS
Krystin L. Grenon, 1837 S. Halsted, Chicago, Ill. 60608
Filed Dec. 1, 1975, Ser. No. 636,414
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—40



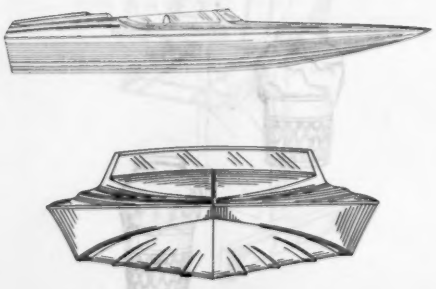
244,766
CROWN FOR A RING
Roy R. Powell, R.D. 1, W. Main Road, North East, Pa. 16428
Filed Dec. 15, 1975, Ser. No. 640,625
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—89

244,767
BUTTERFLY ORNAMENT
Donald R. Ditto, 3129 Maple Leaf Lane, Dallas, Tex. 75233
Filed Jan. 31, 1975, Ser. No. 545,864
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—137

244,768
PLANTER AND A LID THEREFOR
Arthur J. Lacativo, 236 Canyon Drive, Oroville, Calif. 95965
Filed Feb. 27, 1976, Ser. No. 662,188
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—149

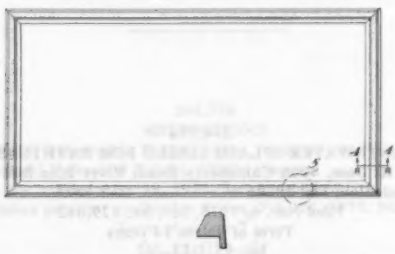


244,769
POWER BOAT
Bruce E. Nescher, 1861 Kashlon, LaHabra Heights, Calif. 90631
Filed June 3, 1975, Ser. No. 583,276
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



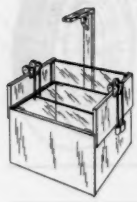
244,770
VEHICLE TIRE
Hiroshi Kojima, Hino; Toshio Hayakawa, Kodaira, and Masafumi Yoshihara, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Feb. 4, 1976, Ser. No. 655,261
Claims priority, application Japan, Aug. 8, 1975, 50-32395
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142

244,771
LICENSE PLATE HOLDER
John A. Bott, 931 Lakeshore Drive, Grosse Pointe Shores, Mich. 48236
Filed Jan. 5, 1976, Ser. No. 646,547
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—193



244,772
DECOY ANCHOR
Floyd E. Zongker, Tulsa, Okla., assignor to Zongker Lead Casting, Inc., (Entire), Tulsa, Okla.
Filed May 20, 1976, Ser. No. 688,485
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—215

244,773
RAT TRAP
Frank S. Curtis, 1009 N. Jenison, Lansing, Mich. 48915
Filed Nov. 17, 1975, Ser. No. 632,266
Term of patent 14 years
Int. Cl. D22—*19*
U.S. Cl. D22—18

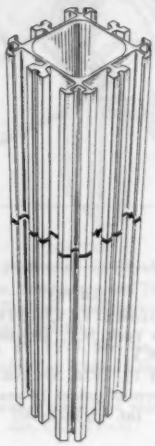


244,774
ANTI-WATER SPLASH SHIELD FOR BATHTUBS
John H. Dose, 4006 Chinaberry Road; River Isles Box 106, Bradenton, Fla. 33505
Filed Nov. 6, 1975, Ser. No. 629,642
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

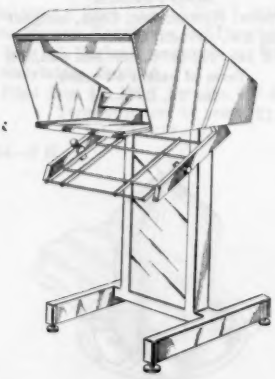
244,775
AIR FRESHENER CONTAINER
Norman E. Wilson, Moscow Mills, Mo., assignor to The Puro Co., Inc.
Filed Dec. 19, 1975, Ser. No. 642,464
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—150

244,776
INFANT NURSING BOTTLE
Paul K. Meeker, 412 Park St., Kent, Ohio 44240
Filed Aug. 16, 1976, Ser. No. 714,529
Term of patent 14 years
Int. Cl. D7—*01*; D9—*01*
U.S. Cl. D24—47

244,777
TUBULAR POST
Bertalan Tamas Bobrovniczky, Don Mills, Canada, assignor to Beautiline Systems Limited
Filed Jan. 7, 1976, Ser. No. 647,165
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75



244,778
COMPONENT LOCATER FOR ELECTRONIC PRODUCT ASSEMBLY OPERATIONS
Lewis A. Latanzi, Bethel, Conn., assignor to Contact Systems, Inc., Danbury, Conn.
Filed Oct. 28, 1975, Ser. No. 625,939
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—99



244,779
MICROPHONE
Yoshiaki Kobayashi, Tokyo, Japan, assignor to Nihon Atsudenki Kabushiki Kaisha, Mitaka, Japan
Filed Aug. 19, 1975, Ser. No. 605,804
Claims priority, application Japan, Feb. 20, 1975, 50-006757
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

244,780
MICROPHONE
Yoshiaki Kobayashi, Tokyo, Japan, assignor to Nihon Atsudenki Kabushiki Kaisha, Mitaka, Japan
Filed Aug. 19, 1975, Ser. No. 605,801
Claims priority, application Japan, Feb. 25, 1975, 50-7508
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

244,781
SPEAKER GRILL
Jack R. Saidel, 1618 Heather-Hill Crescent, Flossmoor, Ill. 60422
Filed Oct. 22, 1976, Ser. No. 734,715
Term of patent 7 years
Int. Cl. D14—*01*, *99*
U.S. Cl. D14—39

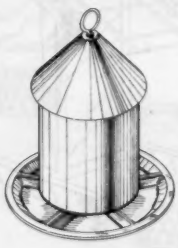
244,782
CIGARETTE LIGHTER
Kenjiro Goto, 4-17-3, Naka-cho, Urawa, Saitama, Japan
Filed Mar. 21, 1975, Ser. No. 560,777
Term of patent 7 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

244,783
CIGARETTE LIGHTER
George O'Brien, New York, N.Y., assignor to Tiffany & Company, New York, N.Y.
Filed July 19, 1976, Ser. No. 706,731
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

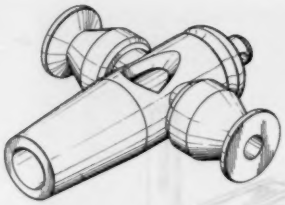
244,784
CIGARETTE LIGHTER
George O'Brien, New York, N.Y., assignor to Tiffany & Company, New York, N.Y.
Filed July 19, 1976, Ser. No. 706,732
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

244,785
CIGARETTE LIGHTER
George O'Brien, New York, N.Y., assignor to Tiffany & Company, New York, N.Y.
Filed July 19, 1976, Ser. No. 706,733
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

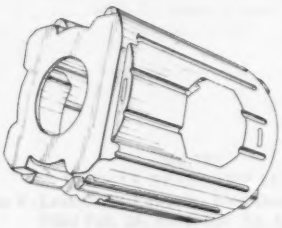
244,786
BIRD FEEDER
Littleton P. Dryden, Westminster, Colo., assignor to Premier Manufacturing Co., Arvada, Colo.
Filed Jan. 12, 1976, Ser. No. 648,330
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15



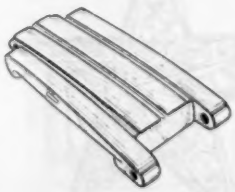
244,787
MUSICAL WHISTLE
Martin B. Cohen, Hillsdale, N.J., assignor to Latin Percussion, Inc.
Filed Aug. 4, 1975, Ser. No. 601,763
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C



244,788
POD MODULE FOR USE AS PLAY EQUIPMENT
Kenneth Peter Burgess, Kew Surrey, and Timothy Sefton Elsdale, London, both of England, assignors to WCB Containers Limited, Stalybridge, England
Filed Aug. 19, 1975, Ser. No. 605,895
Claims priority, application United Kingdom, Feb. 19, 1975, 969950/75
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H



244,789
SLAB MODULE FOR USE AS PLAY EQUIPMENT
Kenneth Peter Burgess, Kew Surrey, and Timothy Sefton Elsdale, London, both of England, assignors to WCB Containers Limited, Stalybridge, England
Filed Aug. 19, 1975, Ser. No. 605,896
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H



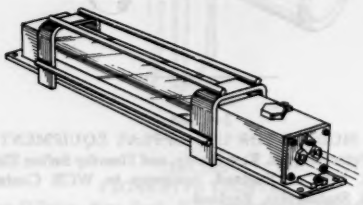
244,790
FIELD HOCKEY STICK
Phillip Howard Carlson, Minneapolis, and Lawrence E. Erickson, Edina, both of Minn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Sept. 16, 1975, Ser. No. 613,968
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 BC

244,791
GOLF STANCE AND SWING PRACTICE DEVICE OR THE LIKE
Edward F. Sullivan, Jr., 6944 Gaillardia Road South, Jacksonville, Fla. 32211
Filed Sept. 24, 1975, Ser. No. 616,309
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

244,792
DRIVING IRON HEAD
Paul B. Gelinas, 66 Prospect St., Manchester, N.H. 03104
Filed May 12, 1976, Ser. No. 685,807
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

244,793
LIGHTING FIXTURE
Alan J. Ruud, West Allis, Wis., assignor to Donald L. Goulet and Alan J. Ruud
Filed July 31, 1975, Ser. No. 600,643
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 A

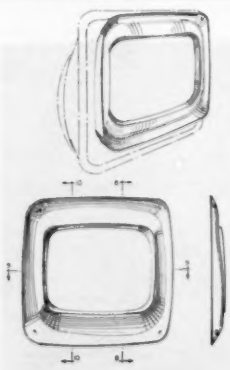
244,794
EXPLOSION PROOF FLUORESCENT LAMP FOR MINES OR THE LIKE
Perfecto Dacal, Beckley, W. Va., assignor to Control Products Inc., Beckley, W. Va.
Filed May 24, 1976, Ser. No. 689,596
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E



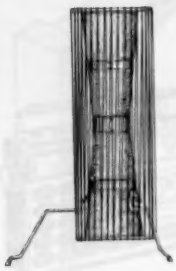
244,795
LIGHTING FIXTURE
Robert M. O'Hara, 1873 Berkley Ave., St. Paul, Minn. 55105
Filed Apr. 11, 1975, Ser. No. 567,398
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

244,796
PENLIGHT
David E. Staub, Clearwater, Fla., assignor to Concept, Inc., Clearwater, Fla.
Filed Nov. 13, 1975, Ser. No. 631,621
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

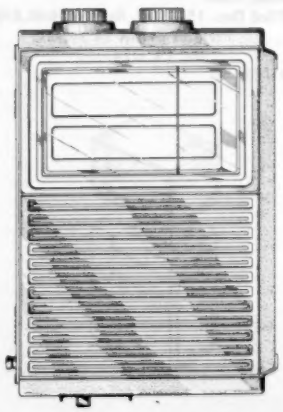
244,797
VEHICLE HEADLAMP BEZEL
William F. Leahy, 624 Edwards, West Dundee, Ill. 60118
Filed Feb. 26, 1976, Ser. No. 661,423
Term of patent 7 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 C



244,798
DRUM
Fred Fleck, 3719 Central Park Circle, Las Vegas, Nev. 89109
Filed Feb. 20, 1975, Ser. No. 551,251
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D56—1 E

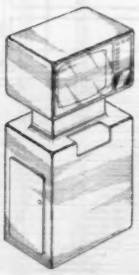


244,799
PORTABLE RADIO
John S. Kolwaite, Dewitt, N.Y., assignor to General Electric Company
Filed June 16, 1975, Ser. No. 587,503
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—75



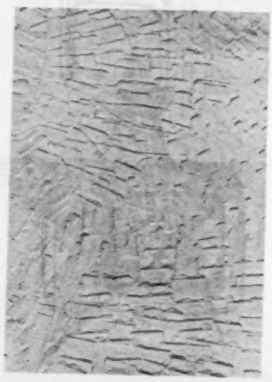
244,800
COMBINED TAPE RECORDER AND RADIO RECEIVER
Katsutoshi Kido, Toyonaka, and Susumu Yamamoto, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Oct. 21, 1975, Ser. No. 624,635
Claims priority, application Japan, Apr. 23, 1975, 50-16299
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—5

244,801
VIDEO PROGRAM SELECTION AND DISPLAY SYSTEM
George R. DeLand, Yorba Linda, Calif., assignor to Odetics, Inc., Anaheim, Calif.
Filed Dec. 15, 1975, Ser. No. 640,838
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—82



244,802
EMBOSSED PLASTIC SHEET MATERIAL
Jared R. Kies, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Apr. 21, 1975, Ser. No. 569,901
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D87—3 G

244,803
EMBOSSED PLASTIC SHEET MATERIAL
Jared R. Kies, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Apr. 21, 1975, Ser. No. 570,282
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D87—3 G



244,804

EMBOSSED PLASTIC SHEET MATERIAL

Jared R. Kies, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

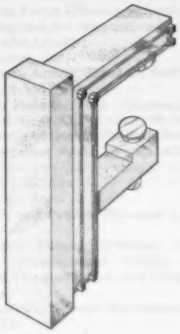
Filed Apr. 21, 1975, Ser. No. 570,290
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D87—3 G

244,805

X-RAY UNIT STAND

Carl-Eric Ohlson, Solna, Sweden, assignor to AO:s Metall & Mek. Verkstad AB, Stockholm, Sweden

Filed May 23, 1975, Ser. No. 580,360
Claims priority, application Sweden, Nov. 25, 1974, 741966
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—2



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF JUNE, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See—*
Welstead, William John, Jr., 4,031,245.

A. J. Harris & Sons, Inc.: *See—*
Raymond, Paul J., 4,030,156.

A P Products Incorporated: *See—*
Venaleck, John T., 4,030,799.

A-T-O Inc.: *See—*
Mais, James W.; and Myers, L. Paul, 4,030,269.

A. van Kaick "AvK" Generatoren- und Motorenwerke, Firma: *See—*
Beck, Dieter, 4,031,455.

Aaltonen, Olavi August; Andersson, Bengt Torsten; Juusela, Jyrki Tapani; Palperi, Matti Johannes; and Tuominen, Tapio Kalevi, to Outokumpu Oy. Process for producing raw copper continuously in one stage from unrefined sulfidic copper concentrate or ore. 4,030,915, Cl. 75-74.000.

AB Bofors: *See—*
Skagerlund, Lars-Erik, 4,030,420.

Abbots, David: *See—*
White, John; and Abbots, David, 4,030,842.

Abbott Laboratories: *See—*
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,031,242.

Abernathy, Frank W. Garbage recycling apparatus. 4,030,670, Cl. 241-14.000.

Abram, Doug. Sissy bar for a motorcycle. 4,030,750, Cl. 297-375.000.

Abramson, Irwin J., to Becton, Dickinson and Company. Novel assembly, compositions and methods. 4,030,978, Cl. 195-75.000.

ACF Industries, Incorporated: *See—*
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 4,030,424.

Ackeret, Peter, to IDN Inventions and Development of Novelties AG. Holders for tape cassettes. 4,030,601, Cl. 206-387.000.

Ackerman, James H., to Sterling Drug Inc. Iodinated anilic acids. 4,031,088, Cl. 260-247.20A.

Ackerman, William R., Jr., to Olin Corporation. Reflex sight reticle illuminator. 4,030,203, Cl. 33-241.000.

Acme Eng. & Mfg. Corporation: *See—*
Bohanon, Hoy R., 4,031,180.

Acme Staple Company, Inc.: *See—*
Gordon, Stanley H., 4,030,656.

Adachi, Yoshio, to Hitachi, Ltd. Motor driving system and circuit therefor. 4,031,448, Cl. 318-696.000.

Adam, John M.: *See—*
Shelton, Jack P., Sr.; and Adam, John M., 4,030,226.

Adams, Terrence Miller: *See—*
Holloran, Thomas Patrick; Braden, Arthur Buell; Foley, Jerrold Stokes; Maynard, James Lucian; Klosky, John Patrick; Dissauer, Gerald Anthony; Adams, Terrence Miller; and Lorenz, Allan Alfred, 4,031,518.

Addressograph Multigraph Corporation: *See—*
Adhikari, Manoj C.; and Gardner, Joseph G., 4,030,409.
Goodwin, Eber Lyle, 4,030,724.
Holloran, Thomas Patrick; Braden, Arthur Buell; Foley, Jerrold Stokes; Maynard, James Lucian; Klosky, John Patrick; Dissauer, Gerald Anthony; Adams, Terrence Miller; and Lorenz, Allan Alfred, 4,031,518.

Adhikari, Manoj C.; and Gardner, Joseph G., to Addressograph Multigraph Corporation. Printing apparatus controls. 4,030,409, Cl. 101-47.000.

Advance Design Laboratories, Inc.: *See—*
Blair, Michael A.; and Hoffman, Robert M., 4,030,158.

AEG-Kanis Turbinenfabrik GmbH: *See—*
Deinlein-Kalb, Hans, 4,030,296.

Agatsuma, Kunio: *See—*
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 4,031,134.

AGFA-Gevaert, A.G.: *See—*
Geisslinger, Wolfgang; and Ungnadner, Peter, 4,030,818.
Idel, Karsten-Josef; Saleck, Wilhelm; Wolff, Erich; and Freitag, Dieter, 4,030,929.
Muller, Gunter; and Kluge, Reimund, 4,030,602.
Renner, Gunter; Boie, Immo; and Scheben, Quirin, 4,031,130.
Stahlke, Kurt-Rainer; Krafft, Werner; Meyer, Rudolf; and Rosenkranz, Hans Jurgen, 4,030,926.
Wick, Richard; Bestenreiner, Friedrich; Deml, Reinhold; and Helmberger, Josef, 4,031,550.

AGFA-GEVAERT N.V.: *See—*
Hofman, Emiel Alexander, 4,030,924.

Agrinskaya, Lidia Ivanovna: *See—*
Khcheyan, Khachik Egorovich; Revenko, Olga Mikhailovna; Shatalova, Alla Nikolaevna; Gelperina, Eleonora Grigorievna; Agrinskaya, Lidia Ivanovna; and Muradian, Georgy Avanesovich, 4,031,128.

Ahlstone, Arthur G., to Vetco Offshore Industries, Inc. Wellhead seal apparatus and pulling tool for releasing and retrieving such apparatus. 4,030,544, Cl. 166-182.000.

Ahrel, Per Johan Ingemar: *See—*
Asplund, Arne Johan Arthur; Reinhall, Rolf Bertil; and Ahrel, Per Johan Ingemar, 4,030,969.

Ahrens, Hanns: Biere, Helmut; Rufer, Clemens; Schmiechen, Ralph; Schroeder, Eberhard; Loge, Olaf; Losert, Wolfgang; and Schillinger, Ekkehard, to Schering Aktiengesellschaft. Novel thiophene derivatives and their preparation. 4,031,236, Cl. 424-275.000.

Aidlin, Joseph W.: *See—*
Kessler, Saul, 4,031,027.

Aircraft Mechanics, Inc.: *See—*
Kelley, Norman S.; and Pearne, Florentin J., 4,030,618.

Aishita, Hideki: *See—*
Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Aishita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, 4,030,977.

Aizawa, Hiroshi: *See—*
Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 4,031,383.

Akademiet for de tekniske Videnskaber, Svejsecentralen: *See—*
Lund, Svend Aage; Northeved, Allan; Solfjeld, Poul; and Fabrin, Knud Christian Claus, 4,030,343.
Northeved, Allan; Fabrin, Knud Christian Claus; and Solfjeld, Poul, 4,030,344.

Akae, Kiyoshi; Kitada, Masaya; and Uno, Yoshiyuki, to Unitika Ltd. Method and apparatus for regenerating activated carbon. 4,030,876, Cl. 432-14.000.

Akashi, Goro: *See—*
Suzuki, Osamu; Akashi, Goro; Kasuga, Akira; and Sega, Kenji, 4,030,685.

Akbari-Kenari, Reza: *See—*
Colter, John Cecil; James, Dean B.; Keith, Walter Gill; and Akbari-Kenari, Reza, 4,031,029.

Akebono Brake Industry Co., Ltd.: *See—*
Ogawa, Yutaka; and Hirai, Hiroshi, 4,030,577.

Akhnazariants, Levon Khachaturovich: *See—*
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Akimoto, Akira: *See—*
Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Aishita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, 4,030,977.

Akimoto, Hidetoshi; Kaji, Ryuichi; Kikuchi, Hideo; Hishinuma, Yukio; and Arikawa, Yoshijiro, to Hitachi, Ltd.; and Babcock-Hitachi K.K. Process for making nitrogen oxides contained in flue gas harmless. 4,031,185, Cl. 423-239.000.

Akira, Itoh: *See—*
Akira, Kato; Akira, Itoh; Tohru, Uchida; and Masao, Ishihara, 4,030,921.

Akira, Kato; Akira, Itoh; Tohru, Uchida; and Masao, Ishihara, to Konishiroku Photo Industry Co., Ltd. Electrophotographic photosensitive material. 4,030,921, Cl. 96-1.500.

Aksjeselskapet Jotul: *See—*
Tronstad, Knut, 4,030,475.

Akzo N.V.: *See—*
Van Assendelft, Leendert, 4,030,248.

Akzona Incorporated: *See—*
deJongh, Hendrik Paul; and van Bokhoven, Cornelis Wilhelmus, 4,031,074.
Paoli, Alfred, 4,030,798.
Woods, Gilbert Frederick; Logan, Robert Thomas; McGarry, George; and Roy, Robert Gibson, 4,031,075.

Albrecht Baumer KG Spezialmaschinenfabrik: *See—*
Poetzsch, Rolf; and Schuster, Hans Gunther, 4,030,386.

Alcan Research and Development Limited: *See—*
Rodenchuk, William Simon; and Eccles, Anthony Garth, 4,030,536.

Alco Standard Corporation: *See—*
Rogers, Ronald D., 4,030,712.

Alderson, Larry Lee: *See—*
McMath, Jack Alan; Wilder, Paul R.; and Alderson, Larry Lee, 4,030,524.

Aldinger, Ulrich; and Kersten, Gunter, to Robert Bosch G.m.b.H. Radial piston machine. 4,030,405, Cl. 92-58.000.

Aleman, Augusto Cuevas. Apparatus and arrangement for conserving water for toilet flushing. 4,030,144, Cl. 4-3.000.

Alexander, Andrew, to Aluminum Company of America. Low temperature vapor sealing of anodized aluminum. 4,031,275, Cl. 427-248.00R.

Alexander, Robert L., to Hunt Manufacturing Co. Hanging file frame with resilient corner members. 4,030,610, Cl. 211-182.000.

Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tatarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich. Sintered cermet containing ground monocrystals. 4,030,891, Cl. 75-234.000.

Alexeeva, Ljubov Antonovna: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.

Alford, Andrew. Stacked arrays for broadcasting elliptically polarized waves. 4,031,536, Cl. 343-796.000.

Alford, Andrew. Collinear dipole array with reflector. 4,031,537, Cl. 343-704.000.

Alkon Laboratories, Inc.: *See—*
Gordon, Peter H., 4,031,451.

Allard, Michael Duane: *See—*
Parish, Harold Cheney; Allard, Michael Duane; Pettit, Jack Leland; and Spulgis, Ivars Sigurds, 4,030,639.

Allegheny Ludlum Industries, Inc.: *See—*
Shilling, Jack W.; Datta, Amitava; and Malagari, Frank A., Jr., 4,030,950.

Allen, Brockenbrough S.: *See—*
Stebbins, Robert C.; Allen, Brockenbrough S.; and Brown, Charles, 4,030,210.

Allen, Robert K.; Schoenfield, Palmer J.; and Morrison, Howard J., to Marvin Glass & Associates. Figure toy play kit. 4,030,234, Cl. 46-1.00R.

Allen, Robert M., to National Semiconductor Corporation. Stripe on strip plating apparatus. 4,030,999, Cl. 204-206.000.

Allenspach, Walter. Multi-function metal-working machine. 4,030,335, Cl. 72-389.000.

Allgood, Jay R. Arch beams and plates. 4,030,265, Cl. 52-723.000.

Allied Chemical Corporation: *See—*
Mendelsohn, Lewis Isaac; and Nesbitt, Ethan Allen, 4,030,892.
Weiss, William Robert; Cooksey, James Judson; Stables, Wilbur Leon; and Newell, Harry Lee, Jr., 4,030,651.

Altman, Janina: *See—*
Haviv, Fortuna; Patchornik, Abraham; and Altman, Janina, 4,031,083.

Altpeter, Arno: *See—*
Bassler, Gerd; and Altpeter, Arno, 4,030,525.

Alumax Mill Products, Inc.: *See—*
Papafingos, Pandelis N.; and Lance, Richard T., 4,030,914.

Aluminum Company of America: *See—*
Alexander, Andrew, 4,031,275.

Aluminum Plumbing Fixture Corporation: *See—*
Rowan, Frank E., 4,030,145.

Alvis, Robert L.; and Newsom, Melvin M., to United States of America, Energy Research and Development Administration. Well drilling apparatus and method. 4,030,557, Cl. 175-4.500.

Alwitt, Robert S., to United Chemi-Con, Inc. Electrolyte capacitors. 4,031,436, Cl. 361-301.000.

Amano, Yoshifumi: *See—*
Arisawa, Kuniyoshi; and Amano, Yoshifumi, 4,031,541.

Amato, Joseph S.: *See—*
Karady, Sandor; and Amato, Joseph S., 4,031,086.

Amchem Products, Inc.: *See—*
Hall, Wilbur S.; and Steinbrecher, Lester, 4,030,945.

Ament, Richard L., II: *See—*
Fullenwider, Malcolm A., 4,031,291.

American Air Filter Company, Inc.: *See—*
Kniss, Edward L., Jr.; Hixenbaugh, Dennis L.; Maudlin, Jerry A.; and Brozenick, Nicholas J., 4,030,740.

American Cyanamid Company: *See—*
Schmitt, Joseph Lawrence, Jr.; Walker, Philip Leroy, Jr.; and Castellion, George Augustus, 4,031,137.
Schrider, Michael Stanley, 4,031,239.

American Fish Company: *See—*
Hoult, David P., 4,030,450.

American Hoechst Corporation: *See—*
Heisley, Grover C.; and Strupczewski, Joseph, 4,031,221.
Martin, Lawrence Leo; and Duffy, Brian J., 4,031,224.

American Optical Corporation: *See—*
Siegmund, Walter P., 4,031,423.

American Science & Engineering, Inc.: *See—*
Jacob, Daniel, 4,031,401.
Stein, Jay A.; and Annis, Martin, 4,031,545.

AMF Incorporated: *See—*
Koch, Claude V., 4,031,339.

AMP Incorporated: *See—*
Bunnell, Edward Dennman, 4,030,801.
Enomoto, Masahiro, 4,030,804.
Sheesley, Wilmer Lee, 4,030,791.

Amsted Industries Incorporated: *See—*
Lea, Paul M., III, 4,030,919.

Analogic Corporation: *See—*
Neumann, Leopold, 4,031,533.

Anders, Walter G., to Diebold, Incorporated. Bank window construction. 4,030,258, Cl. 52-208.000.

Anderson, Arthur E., to Westinghouse Electric Corporation. Projection color television system. 4,031,542, Cl. 358-60.000.

Anderson, Carl Clement; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Mercaptan blocked thermosetting copolymers. 4,031,290, Cl. 428-480.000.

Anderson, James H., to Sea Solar Power, Inc. Pump starting system for sea thermal power plant. 4,030,301, Cl. 60-641.000.

Anderson, John: *See—*
Jesty, Thomas William; Anderson, John; and 53, 4,030,407.

Andersson, Bengt Torsten: *See—*
Aaltonen, Olavi August; Andersson, Bengt Torsten; Juusela, Jyrki Tapani; Palperi, Matti Johannes; and Tuominen, Tapio Kalevi, 4,030,915.

Ando, Shizuo; and Okamura, Akira, to Pioneer Electronic Corporation. Remote controllable telephone answering device having a dual playback capability. 4,031,323, Cl. 179-6.00E.

Andrevski, Zygmunt M.; and Lurie, Michael Jay, to RCA Corporation. Hydrostatic bearing apparatus. 4,030,815, Cl. 350-255.000.

Andrews, James R.: *See—*
Lawton, Robert A.; and Andrews, James R., 4,030,840.

Aneshansley, Nicholas E., to Instrulab Incorporated. Digital second-order clock linearizer. 4,031,530, Cl. 340-347.0NT.

Angell and Associates: *See—*
Angell, Robert L., 4,030,603.

Angell, Robert L., to Angell and Associates. Protective package and method therefor. 4,030,603, Cl. 206-521.000.

Angelopoulos, Peter Gregory: *See—*
Krause, Ernest Harry; Seaman, Wesley Arthur; and Angelopoulos, Peter Gregory, 4,031,466.

Anglada, Leonard R.: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,030,497.

Anglonor S. A.: *See—*
Atmore, Milton Graham Montgomery; and Macpherson, Roy Duncan, 4,030,989.

Angue, Robert: *See—*
Wander, Raoul; and Angue, Robert, 4,030,406.

Ankudinov, Anatoly Kirillovich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.

Annis, Martin: *See—*
Stein, Jay A.; and Annis, Martin, 4,031,545.

Anno, Gousuke, to Tokyo Shibaura Electric Co., Ltd. Artificial kidney device. 4,031,008, Cl. 210-137.000.

Anthony, Andrew James; and Hutchinson, John Jefferson, to Combustion Engineering, Inc. Fuel assembly for a nuclear reactor. 4,030,975, Cl. 176-78.000.

Antonio, Christo; and Uhl, Wyman F., to Litton Business Systems, Inc. Method of manufacture decorative laminate to provide glue adherable back surface. 4,030,955, Cl. 156-235.000.

Anvar Agence Nationale de Valorisation de la Recherche: *See—*
Delcayre, Guy, 4,030,731.

Aoki, Hiroyuki: *See—*
Sugiura, Kensuke; Kagaya, Mineo; Fujisou, Tokuo; Aoki, Hiroyuki; Takehara, Takeichiro; and Kurata, Shigenori, 4,031,020.

Aono, Shunji: *See—*
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 4,031,134.

Aparicio, Luis; Gayo, Nenesio; M° ; Martin, Jose Luis; and Ron, Armando, to Juste, S.A. Quimico-Farmaceutica. 2-(4-Isobutyl phenyl)butyric acid, salts thereof, and pharmaceutical compositions containing the same. 4,031,243, Cl. 424-317.000.

Appleton Electric Company: *See—*
Pastorel, Robert J., 4,031,340.

Arai, Takeshi, to Sanyo Electric Co., Ltd. Electronic channel selecting apparatus. 4,031,475, Cl. 325-455.000.

Arcamone, Federico: *See—*
Patelli, Bianca; Bernardi, Luigi; Arcamone, Federico; and di Marco, Aurelio, 4,031,211.

Archer, John L.; Tocci, Leonard R.; and Williams, Jeffrey L., to Rockwell International Corporation. Magnetic bubble domain detection device. 4,031,526, Cl. 340-174.0TF.

Archer, Wendel Edward, to Bell Telephone Laboratories, Incorporated. Multiple path sealed spring switch. 4,031,494, Cl. 335-154.000.

Archibald, G. Kent, to Minnesota Mining and Manufacturing Company. High frequency-high voltage level electrosurgical unit. 4,030,501, Cl. 128-303.140.

Arenco AB: *See—*
Reichstein, Erik Laurits, 4,030,163.

Arguin, Gerard A. Tandem trailer system. 4,030,171, Cl. 280-408.000.

Arikawa, Yoshijiro: *See—*
Akimoto, Hidetoshi; Kaji, Ryuichi; Kikuchi, Hideo; Hishinuma, Yukio; and Arikawa, Yoshijiro, 4,031,185.

Arisawa, Kuniyoshi; and Amano, Yoshifumi, to Sony Corporation. Color video display system. 4,031,541, Cl. 358-56.000.

Armor, Anthony F.; Chari, Madabushi V. K.; Kudlacik, Henry W.; and Reece, Paul, to General Electric Company. Gas cooled flux shield for dynamoelectric machine. 4,031,422, Cl. 310-256.000.

Arnaud, Guy. Molded packaging system. 4,030,267, Cl. 53-27.000.

Arneklev, Duane R.; and Baker, Don R., to Stauffer Chemical Company. Sulfide herbicide antidote compositions and method of use. 4,030,911, Cl. 71-98.000.

Arnold, Robert Harry, to Metal Box Company Limited, The. Pack-forming apparatus. 4,030,270, Cl. 53-183.000.

Arolski, Angel Tomov; Usheva, Velichka Borissova; Gruev, Peter Vassilev; Richev, Georgi Trendafilov; and Doncheva, Zvetana Semkova, to DSO "Bulgarplod". Method for producing durable fruit-dairy and vegetable-dairy drinks. 4,031,264, Cl. 426-590.000.

Aronoff, Elihu J.; and Dhami, Kewal Singh, to International Telephone and Telegraph Corporation. Crosslinking fluorocarbon compositions using polyallylic esters of polycarboxylic acids. 4,031,167, Cl. 260-884.000.

Aronson, Albert Irving, to RCA Corporation. Passive cooler. 4,030,316, Cl. 62-467.00R.

Arsenault, Albert J.: *See—*
Azadian, Jacques; and Arsenault, Albert J., 4,030,155.

Arthur D. Little, Inc.: *See—*
Trombly, John E., 4,031,449.

Asao, Makoto; Ito, Susumu; and Umehara, Hidetoshi, to Mikuni Kogyo Kabushiki Kaisha. Ultrasonic air humidifying apparatus. 4,031,171, Cl. 261-1.000.

ASEA Aktiebolag: *See—*
Dahle, Orvar; von Knorring, Folke; and Siby, Sture, 4,030,346.
Fredrickson, Bengt; and Stenkvist, Sven-Einar, 4,031,308.

Asperger, Paul. Windmill with shroud adjusting means. 4,031,405, Cl. 290-55.000.

Asplund, Arne Johan Arthur; Reinhall, Rolf Bertil; and Ahrel, Per Johan Ingemar, to Defibrator AB. Method of dispersing a bleaching agent into a stream of fibrous cellulosic pulp material in a throttling nozzle. 4,030,969, Cl. 162-23.000.

Atanassov, Haralampi Aangelov: *See—*
Kochemidov, Atanas Dimitrov; Makedonski, Boris Georgiev; Dumanov, Ivan Minkov; Payakov, Stefan Georgiev; Galabov, Peter Konstantinov; and Atanassov, Haralampi Aangelov, 4,030,249.

Atel Products Limited: *See—*
Board, Kenneth B., 4,030,770.

Atlantic Research Corporation: *See—*
Holly, Sandor, 4,030,830.

Atlantic Richfield Company: *See—*
Edison, Robert Raynold; and Dresser, Thorpe, 4,031,154.
Leonard, John J., 4,031,196.
Simpson, Terry Lee, 4,030,752.
Wilson, Leland Earl, 4,030,305.

Atmore, Milton Graham Montgomery; and Macpherson, Roy Duncan, to Anglonor S. A. Electrowinning process. 4,030,989, Cl. 204-104.000.

Atwood, Felix M., to Square D Company. Safety guard for press brakes. 4,030,364, Cl. 72-389.000.

Audaire, Luc; Borel, Joseph; Le Goascoz, Vincent; and Poujois, Robert, to Commissariat a l'Energie Atomique. Method and device for the integration of analog signals. 4,031,380, Cl. 235-183.000.

Auer, Eberhard: *See—*
Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; Henning, Klaus; and Kandler, Joachim, 4,031,022.

Augat, Inc.: *See—*
Hanlon, Richard J.; Damon, Neil F.; and Yeo, Herbert G., 4,030,793.

Auge, Wolfgang: *See—*
Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, 4,031,116.

Auriol, Alain; and Tritten, Paul, to Compagnie Generale d'Electroceramique. Process for the manufacture of articles of translucent alumina. 4,031,177, Cl. 264-65.000.

Austel, Volkhard: *See—*
Kutter, Eberhard; Austel, Volkhard; Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; Lillie, Christian; and Kadatz, Rudolf, 4,031,219.

Automobiles Peugeot: *See—*
Colinet, Andre, 4,030,379.

Automotive Products Limited: *See—*
Young, Alastair John, 4,030,771.

Avedisian, Armen G. Impermeable ecological barrier and process of making same from reconstituted shale. 4,030,307, Cl. 61-35.000.

Azadian, Jacques; and Arsenault, Albert J. Clog sole. 4,030,155, Cl. 12-146.00B.

B. F. Goodrich Company, The: *See—*
Eden, Jamal S., 4,031,149.

B-5 Associates of Stamford, Connecticut: *See—*
Leonard, Hamlin, 4,030,373.

Baardman, Frank: *See—*
Lukas, Joachim H.; Baardman, Frank; and Kouwenhoven, Adriaan P., 4,031,152.

Babcock-Hitachi K.K.: *See—*
Akimoto, Hidetoshi; Kaji, Ryuichi; Kikuchi, Hideo; Hishinuma, Yukio; and Arikawa, Yoshijiro, 4,031,185.

Babcock & Wilcox Company, The: *See—*
Coleman, Bob G., 4,030,261.

Babson Bros. Co.: *See—*
McKenzie, Wray V., 4,030,513.

Bach, Hans: *See—*
Heinroth, Karl-August; Dietrich, Theo; Bach, Hans; and Jurischka, Hans-Dieter, 4,030,278.

Bach, Nicholas J.; Hall, David A.; and Kornfeld, Edmund C., to Eli Lilly and Company. Descarboxylysergic acid. 4,031,097, Cl. 260-285.500.

Badalich, Frank C., to Bell & Howell Company. Rear screen projector with remote projection capability. 4,030,821, Cl. 353-71.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Bronstert, Klaus; Fahrbach, Gerhard; Krahe, Eduard; Ladenberger, Volker; Kastning, Ernst-Guenther; Mittnacht, Hans; Willersinn, Herbert; and Trieschmann, Hans-Georg, 4,031,166.

Bahna, Jarolim: *See—*
Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, 4,030,944.

Bailey, Alfred J.; and Dean, Malcolm, to Massey-Ferguson Services N.V. Implements for delivering particulate material to the ground. 4,030,641, Cl. 222-317.000.

Bake, Earl A.; and Schoeneweis, E. Frederick, to Rockwell International Corporation. Valve positioning handle. 4,030,696, Cl. 251-288.000.

Baker, Don R., to Stauffer Chemical Company. Certain bromoacetoxy acetylenes as slime control agents. 4,031,241, Cl. 424-311.000.

Baker, Don R.: *See—*
Arneklev, Duane R.; and Baker, Don R., 4,030,911.

Baker, Irwin Gerald: *See—*
Brogan, Joseph; and Baker, Irwin Gerald, 4,030,787.

Bakerdrill, Inc.: *See—*
Kammerer, Archer W., Jr.; and Curington, Alfred R., 4,030,554.

Bakgaard, Knud Erik, to Bang & Olufsen A/S. Loudspeaker systems. 4,031,321, Cl. 179-1.00D.

Balasty, Darrell S. Triangular holder and instrument. 4,030,841, Cl. 401-6.000.

Ban, Itsuki; and Mochizuki, Kazunori. Mode changeover apparatus for recorder/player. 4,031,556, Cl. 360-96.000.

Ban, Itsuki; and Mochizuki, Kasunori. Casette loading device for use in magnetic sound recording and playing back apparatus. 4,031,557, Cl. 360-96.000.

Bang & Olufsen A/S: *See—*
Bakgaard, Knud Erik, 4,031,321.

Bannister, Brian, to Upjohn Company, The. Process for preparing lincomycin derivatives. 4,031,304, Cl. 536-11.000.

Barba, Diego; Germana, Antonino; Liuzzo, Giuseppe; and Tagliaferri, Giovanni, to Societa' Italiana Resine S.I.R. S.p.A. Apparatus for desalting saline water. 4,030,985, Cl. 202-174.000.

Barba, Diego; Battistoni, Fabrizio; D'Agostini, Candido; and Macchi, Giorgio, to Societa' Italiana Resine S.I.R. S.p.A. Process for the production of nitric acid. 4,031,187, Cl. 423-392.000.

Barber, William R., Jr., to Esco Corporation. Method of casting beneficiation. 4,030,253, Cl. 51-321.000.

Barbieri, Siegfried, to Durst AG Fabrik Fototechnischer Apparate Bozer. Color filter determining apparatus. 4,030,833, Cl. 356-175.000.

Bardsley, James G. Portable holder for roll of perforated paper towel. 4,030,676, Cl. 242-55.540.

Barna, Joseph A.: *See—*
Brugger, Richard D.; and Barna, Joseph A., 4,031,362.

Barnes, Tracy W., to Laidlaw Corporation. Method of flocking metal articles. 4,031,270, Cl. 427-27.000.

Barrault, Michel Raymond, to Imperial Chemical Industries Limited. Anode adjustment. 4,030,998, Cl. 204-219.000.

Barth, Wayne E., to Pfizer Inc. Antibacterial 3-phosphono penams. 4,031,077, Cl. 260-239.100.

Bartoli, Francesco: *See—*
Lostia, Onofrio; and Bartoli, Francesco, 4,031,201.

BASF Aktiengesellschaft: *See—*
Cordes, Claus; and Sterzel, Hans-Josef, 4,031,065.
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Lebert, Ulrich; and Thiessen, Fritz, 4,031,135.
Fischer, Adolf, deceased, 4,030,909.
Hoffmann, Werner; and Baumann, Manfred, 4,031,141.
Oppenlaender, Knut; Uhl, Guenter; Helfert, Herbert; Scharpenberg, Hans-Georg; and Stork, Karl, 4,031,112.
Rapp, Guenther; Fuchs, Hugo; and Thomas, Erwin, 4,031,139.
Tatzel, Hermann; Koegel, Wolfram; Beck, Gilbert; Zuern, Ludwig; and Caesar, Arndt Christian, 4,031,179.

Bassler, Gerd; and Altpeter, Arno, to Robert Bosch G.m.b.H. Corrosion-resistant sheet steel weld. 4,030,525, Cl. 428-586.000.

Basta, Tom: *See—*
Linck, Donald W., II; and Kaprelian, George, 4,030,197.

Bastian, Jean-Michel; and Berthold, Richard, to Sandoz Ltd. 4H-Benzo[4,5]cyclohepta[1,2-b]thiophenes. 4,031,225, Cl. 424-267.000.

Battelle Memorial Institute: *See—*
Vollerin, Bernard, 4,030,874.

Battistoni, Fabrizio: *See—*
Barba, Diego; Battistoni, Fabrizio; D'Agostini, Candido; and Macchi, Giorgio, 4,031,187.

Battye, Christopher John; and Dorey, Roger John, to United Glass,

Ltd. Surface coating of glass containers while annealing. 4,030,904, Cl. 65-60.00A.

Baudoin, Jean-Claude; and Oger, Robert, to Commissariat a l'Energie Atomique. Device for applying tension to belts or cables for a remote manipulation. 4,030,376, Cl. 74-242.11C.

Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, to Bayer Aktiengesellschaft. Antibiotic. 4,031,207, Cl. 424-118.000.

Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Karl Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, to Bayer Aktiengesellschaft. Antibiotic. 4,031,208, Cl. 424-119.000.

Bauer, Martin L.; Johnson, Wayne F.; and Lakomy, Dale G., to United States of America, Energy Research and Development Administration. Dynamic multistation photometer. 4,030,834, Cl. 356-197.000.

Baumann, Karl-Heinz: *See—*
Enneking, Heinrich; Schubert, Gunter; and Baumann, Karl-Heinz, 4,030,169.

Baumann, Manfred: *See—*
Hoffmann, Werner; and Baumann, Manfred, 4,031,141.

Baxter Travenol Laboratories, Inc.: *See—*
Tompkins, Douglas L., 4,030,498.
Virag, Robert Anthony, 4,030,495.

Bayer Aktiengesellschaft: *See—*
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,207.
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Karl Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,208.
Boden, Heinrich; and Knipp, Ulrich, 4,030,637.
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 4,031,104.
Dhein, Rolf; Zabrocki, Karl; Beer, Wolfgang; and Kuchenmeister, Rolf, 4,031,047.
Dhein, Rolf; Schoeps, Jochen; and Kuchenmeister, Rolf, 4,031,052.
Heinroth, Karl-August; Dietrich, Theo; Bach, Hans; and Jurischka, Hans-Dieter, 4,030,278.
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,031,229.
Sundermann, Rudolf; Rottloff, Gunther; and Grigat, Ernst, 4,031,067.
Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, 4,031,116.

Bayerische Motoren Werke Aktiengesellschaft: *See—*
Schild, Ekkehard, 4,030,467.

Baylor, John Merlin, to J. I. Case Company. Crawler tractor track chain drive assembly. 4,030,782, Cl. 305-57.000.

Bayly, Russell James; Chambers, Virginia Edith May; and Monks, Reginald, to Radiochemical Centre Limited, The. Saturation analysis. 4,030,886, Cl. 23-230.600.

Beard, Colin C., to Syntex (U.S.A.) Inc. 5(6)-Benzene ring substituted benzimidazole-2-carbamate derivatives having anti-protozoal activity. 4,031,228, Cl. 424-270.000.

Beard, Colin C.; Edwards, John A.; and Fried, John H., to Syntex (U.S.A.) Inc. 1,5(6)-Disubstituted benzimidazole-2-carbamate derivatives having anthelmintic activity. 4,031,234, Cl. 424-273.000.

Beatrice Foods Co.: *See—*
Kasik, Robert L.; and Peterson, Marvin A., 4,031,254.

Beaucaire, Victor D.: *See—*
Marlin, Louis Allen; and Beaucaire, Victor D., 4,030,894.

Beaver, Emil Routzong, Jr. Solar energy collectors. 4,030,478, Cl. 126-271.000.

Becher, Wilfried; and Massonne, Joachim, to Kali-Chemie Aktiengesellschaft. Process for preparing calcium fluoride from hexafluoro silicic acid. 4,031,193, Cl. 423-490.000.

Becht, Carl T.: *See—*
Rothfuss, Robert G.; and Becht, Carl T., 4,030,655.

Beck, Dieter, to A. van Kaick "AvK" Generatoren- und Motorenwerke, Firma. Excitation circuit for brushless synchronous welding generators. 4,031,455, Cl. 322-27.000.

Beck, Earl J., Jr., to United States of America, Navy. Solar collector control system. 4,031,444, Cl. 318-562.000.

Beck, Gilbert: *See—*
Tatzel, Hermann; Koegel, Wolfram; Beck, Gilbert; Zuern, Ludwig; and Caesar, Arndt Christian, 4,031,179.

Beck, Kurt Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, to Bergwerksverband GmbH; and Didier Engineering GmbH. Method of restricting dust development when feeding coal into coke ovens. 4,030,983, Cl. 201-23.000.

Beckford, Orville A.; and Dauzickas, Helen F. B., to Corning Glass Works. Apparatus and method for identification of selected clinical yeast. 4,030,980, Cl. 195-139.000.

Beckman Instruments, Inc.: *See—*
Blanke, John David; and Brunell, Norman Eliot, 4,030,349.
Conn, Thomas E.; and Grilli, Victor J., 4,030,663.
Klein, Gerald Lee; and Meyer, Richard C., 4,031,399.

Beckwith, Robert. Velocity computing chronograph. 4,031,373, Cl. 235-151.320.

Becton, Dickinson and Company: *See—*
Abramson, Irwin J., 4,030,978.
Rao, Pemmaraju Narasimha, 4,031,117.

Beddow, Frank Howard: *See—*
Elloy, Martin Arthur; and Beddow, Frank Howard, 4,030,143.

Beecham Group Limited: *See—*
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 4,031,099.

Beer, Wolfgang: *See—*
Dhein, Rolf; Zabrocki, Karl; Beer, Wolfgang; and Kuchenmeister, Rolf, 4,031,047.

Beierle, Carl; and Irik, Harry. Wire or cable reel support. 4,030,704, Cl. 254-139.100.

Beinglass, Israel: *See—*
Schieber, Michael M.; Beinglass, Israel; and Dishon, Giora, 4,030,964.

Belke, William H.; and Hafele, Joseph C., to Caterpillar Tractor Co. Variable focus right angle mirror for laser beam manipulation. 4,030,816, Cl. 350-294.000.

Bell, Edward W., to United States of America, Agriculture. Alcohol esters of fatty acids as useful metalworking lubricants. 4,031,019, Cl. 252-56.00S.

Bell & Howell Company: *See—*
Badalich, Frank C., 4,030,821.

Bell & Howell Limited: *See—*
Catherall, Reginald, 4,031,370.

Bell, Reynold W.: *See—*
Johnson, Ronald P.; and Bell, Reynold W., 4,031,507.

Bell Telephone Laboratories, Incorporated: *See—*
Archer, Wendel Edward, 4,031,494.
Dudonis, Ronald Michael, 4,031,324.
Dudonis, Ronald Michael; Morrison, Charles Glenn; Potter, Robert Lawrence; and Streisand, Kenneth, 4,031,325.
Kaiser, Peter, 4,030,901.
Khanna, Satya Pal, 4,031,272.
Lundgren, Carl William, Jr., 4,031,538.
Peters, Daniel Vern, 4,031,559.
Van Der Wielen, Michael Principe, 4,031,493.

Belleli Industrie Meccaniche S.p.A: *See—*
Roma, Carlo, 4,030,540.

Bellmann, Manfred; and Goldberg, Hannes, to Mannesmann Aktiengesellschaft. Method and means for separating successive rolling lots. 4,030,333, Cl. 72-227.000.

Beloit Corporation: *See—*
Justus, Edgar J., 4,030,971.

Belous, Viktor Mikhailovich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.

Beltek Corporation: *See—*
Umeda, Tomoyoshi; and Haraguchi, Yoshimasa, 4,031,554.

Bencini, Roberto. Cinematic equipment shutter selector mechanism. 4,030,819, Cl. 352-79.000.

Bender, Richard E.: *See—*
Schaefer, William H.; and Bender, Richard E., 4,031,181.

Bendix Corporation, The: *See—*
Heaman, James Patrick; and Michaud, James Anthony, 4,031,369.
Kiwior, Alexander Michael, 4,030,668.

Bengtsson, Bo Gunnar, to Trascandica AG. Ship's dock. 4,030,437, Cl. 114-46.000.

Bennett, Frank William, to Fisons Limited. Process of prilling molten materials. 4,031,174, Cl. 264-14.000.

Beno, Lawrence A., to United States of America, Navy. Multiple polarization switch. 4,031,488, Cl. 333-21.00A.

Benson, John Terry: *See—*
White, Peter Charles; Benson, John Terry; and Leoncavallo, Richard Anthony, 4,030,239.

Benzie, Thomas P.: *See—*
Poli, Albert A.; Bossart, Clayton J.; and Benzie, Thomas P., 4,030,887.

Berenblit, Vsevolod Volfovich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.

Berg, Jeffrey H.: *See—*
Haas, Gerhard J.; and Berg, Jeffrey H., 4,031,258.

Berger, Abe. Polyimide containing silicones as protective coating on semiconductor device. 4,030,948, Cl. 148-33.300.

Berger, Hans; De Lind Van Wijngaarden, Gerhard; and Breuker, Jacobus H., to Shell Oil Company. Base oil compositions having improved light stability. 4,031,016, Cl. 252-50.000.

Bergmann, Rolf: *See—*
Gottschlich, Rudolf; Rogalski, Werner; Bergmann, Rolf; Steinigeweg, Rosmarie; and Wahlig, Helmut, 4,031,230.

Bergwerksverband GmbH: *See—*
Beck, Kurt Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, 4,030,983.

Berkeley Varitronics Systems: *See—*
Holz, George E., 4,031,543.

Berkovitz, Harry, to Westinghouse Electric Corporation. Traction elevator system having cable groove in drive sheave formed by

spaced, elastically deflectable metallic ring members. 4,030,569, Cl. 187-20.000.

Berkowitz, Sidney; and D'Angelo, John, to FMC Corporation. Process for purifying crude cyanuric acid. 4,031,091, Cl. 260-248.00A.

Bernal G., Enrique; Koepke, Barry G.; and Maciolek, Ralph B., to Honeywell Inc. High strength halide alloys. 4,031,190, Cl. 423-466.000.

Bernard, Nicolle; and Forterre, Gerard, to Societe Lignes Telegraphiques et Telephoniques. VHF high-power broadband isolators. 4,031,489, Cl. 333-24.200.

Bernardi, Luigi: *See—*
Patelli, Bianca; Bernardi, Luigi; Arcamone, Federico; and di Marco, Aurelio, 4,031,211.

Berney, Jean-Claude, to Ebauches S.A. Control device for the rotary motor of a watch. 4,031,438, Cl. 318-331.000.

Berry, Martin F.; Reesman, Stanley H.; Smith, Marvin L.; and Middlesworth, Peter Van, to General Foods Corporation. Expanded protein product and method of making same. 4,031,267, Cl. 426-656.000.

Bertetto, Donald W.: *See—*
Hanson, Alden B.; Hanson, Chris A.; and Bertetto, Donald W., 4,030,214.

Berthold, Richard: *See—*
Bastian, Jean-Michel; and Berthold, Richard, 4,031,225.

Besancenot, Serge. Mechanism for controlling the advance of a magazine in a transparency projector. 4,030,822, Cl. 353-103.000.

Bessen, Irwin I., to General Electric Company. Method for coating cavities with metal. 4,031,274, Cl. 427-229.000.

Bestenreiner, Friedrich: *See—*
Wick, Richard; Bestenreiner, Friedrich; Deml, Reinhold; and Helmberger, Josef, 4,031,550.

Betters, Paul D. Safety pin. 4,030,166, Cl. 24-156.00R.

Betts, E. Douglas, to Outboard Marine Corporation. Lined engine block member including a threaded opening and method for providing same. 4,030,470, Cl. 123-193.00C.

Bevles Co., Inc.: *See—*
Hock, Lester R., 4,030,476.

Bhakuni, Roop S.; and Rye, Grover W., to Goodyear Tire & Rubber Company, The. Bonding tire cord to rubber. 4,031,288, Cl. 428-395.000.

Biancardi, Frank R.: *See—*
Freiberg, Robert J.; Fradin, David W.; Chenausky, Peter P.; and Biancardi, Frank R., 4,031,484.

Bichsel, Daniel, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Pickup for measuring the rate of an electronic timepiece. 4,030,337, Cl. 73-6.000.

Biebuyck, Lawrence F.: *See—*
Sukolics, Ronald D.; and Biebuyck, Lawrence F., 4,030,260.

Biedermann, Horst H., to NCR Corporation. Document feeding mechanism. 4,030,726, Cl. 271-246.000.

Bier, Manfred, to Porsche AG. Apparatus for simulating variable air pressures. 4,030,350, Cl. 73-117.100.

Biere, Helmut: *See—*
Ahrens, Hanns; Biere, Helmut; Rufer, Clemens; Schmiechen, Ralph; Schroeder, Eberhard; Loge, Olaf; Losert, Wolfgang; and Schillinger, Ekkehard, 4,031,236.

Bigelow-Sanford, Inc.: *See—*
Weller, John V. C.; Strydio, George C.; and Vits, Helmuth, 4,031,280.

Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., to Kendall Company, The. Syringe assembly. 4,030,497, Cl. 128-215.000.

Bingham and Taylor: *See—*
Zinn, Frank R., 4,030,519.

Birum, Gail H., to Monsanto Company. Phosphorus compounds. 4,031,170, Cl. 260-932.000.

Bissell, Henry M. Simple machine. 4,030,703, Cl. 254-135.00R.

Bittermann, Hans, to Siemens Aktiengesellschaft. Arrangement for connecting information transducers in program controlled processing systems. 4,031,314, Cl. 178-3.000.

BJ-Hughes Inc.: *See—*
Langowski, Faustyn Cornell, 4,030,746.

Black Clawson Company, The: *See—*
Couture, Joseph Walter, 4,030,671.

Blackwell, Samuel E., to Eastman Kodak Company. Solvent dyeing compositions and a method of dyeing polyester fibers therewith. 4,030,882, Cl. 8-39.00R.

Blair, Michael A.; and Hoffman, Robert M., to Advance Design Laboratories, Inc. Hair brush. 4,030,158, Cl. 15-159.00A.

Blanke, John David; and Brunell, Norman Eliot, to Beckman Instruments, Inc. Engine analysis apparatus. 4,030,349, Cl. 73-116.000.

Bleeker, Raymond A., to Westinghouse Electric Corporation. Non-exposed drawer lock. 4,030,788, Cl. 312-333.000.

Bly, Herbert Arthur. Method of forming captive can closure. 4,030,433, Cl. 113-121.00C.

Board, Kenneth B., to Atel Products Limited. Rear wheel jacking system. 4,030,770, Cl. 280-43.230.

Bobka, George R., to Raymond Lee Organization, Inc., The. Portable trailer dump bed. 4,030,751, Cl. 298-1.00A.

Bode, Herbert, to Claudius Peters AG. Thrust grate such as a heat exchange grate. 4,030,206, Cl. 34-164.000.

Boden, Heinrich; and Knipp, Ulrich, to Bayer Aktiengesellschaft. Apparatus for dosing and mixing fluid reactants. 4,030,637, Cl. 222-137.000.

Boehringer Ingelheim GmbH: *See—*
Koppe, Herbert; Zeile, Karl; Kummer, Werner; Stahle, Helmut; and Danneberg, Peter, 4,031,244.

Kutter, Eberhard; Austel, Volkhard; Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; Lillie, Christian; and Kadatz, Rudolf, 4,031,219.

Losel, Walter; Traunecker, Werner; and Hoefke, Wolfgang, 4,031,212.

Boehringer Mannheim G.m.b.H.: *See—*
Kuhn, Rolf; Hardebeck, Klaus; and Heinemann, Helmut, 4,031,213.

Boeing Company, The: *See—*
Brogan, Joseph; and Baker, Irwin Gerald, 4,030,787.
Cacciola, Michael John; and Mjolsnes, Leonard Olaf, 4,030,578.
Hapke, Donald William, 4,030,687.
Stachowiak, Claude R., 4,030,290.

Boettcher, William A. Brush accessory for floor sanders. 4,030,251, Cl. 51-177.000.

Boetto, Charles; Orkwiszewski, Wayne L.; and Connor, Donald E., to International Harvester Company. Folding flex toolbar. 4,030,551, Cl. 172-126.000.

Boffa, Gioacchino: *See—*
Pieri, Giampiero; Carlini, Filippo Maria; Paffoni, Camillo; and Boffa, Gioacchino, 4,031,096.

Bogue, John C.: *See—*
Sarbacher, Robert I.; and Bogue, John C., 4,031,296.

Bohanon, Hoy R., to Acme Eng. & Mfg. Corporation. Cooling pad system. 4,031,180, Cl. 261-106.000.

Boie, Immo: *See—*
Renner, Gunter; Boie, Immo; and Scheben, Quirin, 4,031,130.

Boll, Jurgen: *See—*
Buttner, Karl; Boll, Jurgen; and Wolfel, Kurt, 4,030,174.

Bolles, Theodore F.: *See—*
Jackson, Richard A.; and Bolles, Theodore F., 4,031,198.

Bond, Walter L.; Cutler, Cassius C.; and Lemons, Ross A., to Leland Stanford Junior University, The Board of Trustees of. Acoustic microscope for scanning an object stereo-optically and with dark field imaging. 4,030,342, Cl. 73-67.50R.

Bondarenko, Oleg Alexandrovich: *See—*
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Bonner, John J.: *See—*
Kazahaya, Masahiro; and Bonner, John J., 4,030,366.

Bontrager, Jacob. Vehicle supported motor lift. 4,030,705, Cl. 254-139.100.

Borel, Joseph; and Robert, Jacques, to Commissariat a l'Energie Atomique. Thermal method for controlling the optical properties of a liquid crystal and devices for the application of said method. 4,031,529, Cl. 340-324.00R.

Borel, Joseph: *See—*
Audaire, Luc; Borel, Joseph; Le Goascoz, Vincent; and Poujois, Robert, 4,031,380.

Borg-Warner Corporation: *See—*
Harnish, James R., 4,030,315.
Robinson, Elmer D.; and Struttmann, Hilarius S., 4,030,785.

Borgqvist, Lennart Rickard, to Kamas Industri Aktiebolag. Process and an apparatus for producing fluffed fiber materials. 4,030,672, Cl. 241-18.000.

Borys, Emil G., Jr., to Hydrometals, Inc. Impedance matching device. 4,031,540, Cl. 343-860.000.

Bosa, Primo, to Hooker Chemicals & Plastics Corporation. Electrolytic cell for the production of alkali metal hydroxides having removable orifices for metering fluids to the anode and cathode compartments. 4,031,001, Cl. 204-257.000.

Boser, Ronald J.; and Siegel, Walter P., to Special Sewing Systems, Inc. Sewing machine attachment. 4,030,429, Cl. 112-104.000.

Bossart, Clayton J.: *See—*
Poli, Albert A.; Bossart, Clayton J.; and Benzie, Thomas P., 4,030,887.

Bosserman, David A.; and Freeman, Charles F., to United States of America, Army. Miniature flat panel photocathode and microchannel plate picture element array image intensifier tube. 4,031,552, Cl. 358-241.000.

Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, to Bayer Aktiengesellschaft. 1,4-Dihydropyridine carboxylic acid esters. 4,031,104, Cl. 260-295.50R.

Bouchal, Karel: *See—*
Kalal, Jaroslav; Coupek, Jiri; Pokorny, Svatopluk; Svec, Frantisek; and Bouchal, Karel, 4,031,037.

Bouck, Larry S., to Cities Service Company. Recovery of geothermal energy. 4,030,549, Cl. 166-280.000.

Bourgeois, Jean-Luc: *See—*
Bouy, Pierre; Juillard, Michel; and Bourgeois, Jean-Luc, 4,031,041.

Bourgery, Guy R.: *See—*
Fauran, Claude P.; Bourgery, Guy R.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,031,089.

Bouvier, David William; Green, William Geary; and Moore, Randolph Gaylon, to Motorola, Inc. Frequency spectrum analyzer. 4,031,462, Cl. 324-77.00B.

Bouy, Pierre; Juillard, Michel; and Bourgeois, Jean-Luc, to Rhone-

Poulenc Industries. Cloth comprising asbestos fibers and method of producing said cloth. 4,031,041, Cl. 260-2.50M.

Bower, Lewis Robert: *See—*
Dudley, Philip; Bower, Lewis Robert; and Wake, Malcolm, 4,030,308.

Bowers, David L., to General Electric Company. Standby heart pacer. 4,030,510, Cl. 128-419.0PG.

Boyce, John G.; and Boyce, Richard G. Wiggle table electronic ball game device. 4,030,555, Cl. 273-110.000.

Boyce, Richard G.: *See—*
Boyce, John G.; and Boyce, Richard G., 4,030,555.

Boyd, Violet; Fishwick, Brian Ribbons; and Glover, Brian, to Imperial Chemical Industries Limited. Coloration process. 4,030,881, Cl. 8-39.00C.

Bozhko, Valery Pavlovich: *See—*
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Bozhko, Viktor Vasilievich: *See—*
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Braden, Arthur Buell: *See—*
Holloran, Thomas Patrick; Braden, Arthur Buell; Foley, Jerrold Stokes; Maynard, James Lucian; Klosky, John Patrick; Dissauer, Gerald Anthony; Adams, Terrence Miller; and Lorenz, Allan Alfred, 4,031,518.

Brand, Bridget A.; and Brand, Joseph. Sound producing device. 4,031,320, Cl. 179-1.0AA.

Brand, Joseph: *See—*
Brand, Bridget A.; and Brand, Joseph, 4,031,320.

Brand, Wayne R. Safety check bill receptacle. 4,031,357, Cl. 235-12.000.

Brandenstein, Manfred: *See—*
Ernst, Horst M.; Olschewski, Armin; and Brandenstein, Manfred, 4,030,191.

Brax, Harri J.; Porinchak, Joseph F.; and Weinberg, Alan S., to W. R. Grace & Co. Polymer film with narrow molecular weight distribution and saran and laminates thereof. 4,031,162, Cl. 260-837.0PV.

Breuker, Jacobus H.: *See—*
Berger, Hans; De Lind Van Wijngaarden, Gerhard; and Breuker, Jacobus H., 4,031,016.

Bricknell, William H.; and Sunderlage, Gerald N., to Clark Equipment Company. Fairlead and implement hitch and method of implement retrieval. 4,030,776, Cl. 280-477.000.

Bridges, Alvin C. Adjustable mounting for pivotal wheel support. 4,030,737, Cl. 280-661.000.

Bridges, Ronald P. Electrical interrupter switch. 4,031,346, Cl. 200-146.00R.

Bridwell, John W.; Hopkins, Donald L.; and Lohbauer, Kenneth R., to Caterpillar Tractor Co. Hydraulic circuitry for an excavator. 4,030,623, Cl. 214-138.00R.

Briney, Douglas W., to General Dynamics Corporation. Optical scanning system with canted and tilted reflectors. 4,030,807, Cl. 350-7.000.

Brinza, Joseph E.: *See—*
Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., 4,030,708.

Bristol-Myers Company: *See—*
Juby, Peter Frederick; and Partyka, Richard Anthony, 4,031,093.

British Aircraft Corporation Limited: *See—*
Pedlar, Roy; Spencer, Alan Roderick; and Edwards, Colin, 4,030,434.

British Petroleum Company Limited, The: *See—*
Telfer, Ian Edmund, 4,030,438.

Britton, James S., to Westinghouse Electric Corporation. CMOS comparator. 4,031,511, Cl. 340-146.200.

Brock, Helmut E. Sun shade apparatus. 4,030,748, Cl. 297-184.000.

Brogan, Joseph; and Baker, Irwin Gerald, to Boeing Company, The. Turntable bearing. 4,030,787, Cl. 308-227.000.

Bromels, Marilyn H.: *See—*
Pedersen, Charles John; and Bromels, Marilyn H., 4,031,111.

Bronstert, Klaus; Fahrbach, Gerhard; Krahe, Eduard; Ladenberger, Volker; Kastning, Ernst-Guenther; Mittnacht, Hans; Willersinn, Herbert; and Trieschmann, Hans-Georg, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Impact-resistant polystyrene, α-olefin, block copolymer blends. 4,031,166, Cl. 260-876.00B.

Brooks, Norman B.; and Olmstead, Michael M., to Pass-Port Systems, Inc. Wafer transport system. 4,030,622, Cl. 214-17.00B.

Brown, Charles: *See—*
Stebbins, Robert C.; Allen, Brockenbrough S.; and Brown, Charles, 4,030,210.

Brown, Harold Ben. Air treating dispenser. 4,030,474, Cl. 126-113.000.

Brown, John William. Storage device for shared game pieces. 4,030,765, Cl. 273-148.00R.

Brown Oil Tools, Inc.: *See—*
Rogers, Jerry L.; and Cochran, Chudleigh B., 4,030,546.

Brown, Omar L., to Fraze, Ermal C. Easy-open ecology end. 4,030,631, Cl. 220-269.000.

Brown, Paul L., to Dow Corning Corporation. Organobromosilicone fluids. 4,031,121, Cl. 260-448.80R.

Brown, Paul L., to Dow Corning Corporation. Arylorganobromosilicone compounds. 4,031,122, Cl. 260-448.80R.

Brown, Robert Saul; Eschenbach, Paul W.; and King, Herbert Ray, to Milliken Research Corporation. Quick disconnect coupling. 4,030,582, Cl. 192-67.00P.

Brown & Root, Inc.: *See—*
Rafferty, Andrew J., 4,030,311.

Brozenick, Nicholas J.: *See—*
Kniss, Edward L., Jr.; Hixenbaugh, Dennis L.; Maudlin, Jerry A.; and Brozenick, Nicholas J., 4,030,740.

Brueckner, Wolfgang, to Siemens Aktiengesellschaft. Thermistor device. 4,031,499, Cl. 338-23.000.

Brugger, Richard D.; and Lovercheck, Charles L. Copying machine. 4,030,823, Cl. 355-8.000.

Brugger, Richard D.; and Barna, Joseph A., to Zurn Industries, Inc. Electronic remote reading system for a meter. 4,031,362, Cl. 235-92.0FL.

Brunell, Norman Eliot: *See—*
Blanke, John David; and Brunell, Norman Eliot, 4,030,349.

Bruni, Rudolph C. Spade bit holder. 4,030,599, Cl. 206-379.000.

Brunswick Corporation: *See—*
Puryear, John W., 4,030,473.

Bucalo, Louis. Method and apparatus for providing living beings with absorbable implants. 4,030,499, Cl. 128-260.000.

Buchman, William W., to Hughes Aircraft Company. Position determining systems. 4,030,686, Cl. 244-3.130.

Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, to Beecham Group Limited. 4-Hydroxy-3-nitro-5,6,7,8 tetrahydro-carbostyrils. 4,031,099, Cl. 260-289.00K.

Buckley, Donald J.: *See—*
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 4,031,300.

Buckner, William L. Traction apparatus. 4,030,489, Cl. 128-75.000.

Bucyrus-Erie Company: *See—*
Christian, Edward H.; Mains, Donald M.; and Treiber, James H., 4,031,440.

Budevski, Evgueni Bogdanov; Iliev, Iliya Dimitrov; Kaisheva, Anastasiya Rostislavova; Gamburtzev, Sergei Sergeev; and Vakanova, Elena Borisova, to ZLEHIT pri BAN. Method for producing powdered wetproofed material useful in making gas-diffusion electrodes. 4,031,033, Cl. 252-511.000.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; and Bugaut, Andree, 4,031,160.

Buildex Incorporated: *See—*
Loikitz, Frank F., 4,030,161.

Bukowick, Peter Anthony, to Hercules Incorporated. Certain oximinyl allophanates and their use as herbicides. 4,030,912, Cl. 71-120.000.

Bulman, David Nicholas; and Maunder, Leonard, to National Research Development Corporation. Gyroscopic apparatus. 4,030,371, Cl. 74-5.00F.

Bultez, Alain E.: *See—*
Vaesken, Maryvonne J.; Bultez, Alain E.; and Dalle, Jean-Paul, 4,030,883.

Bunce, Donald A., to Kelvinator, Inc. Refrigerator construction and the manufacture of panels therefor. 4,030,870, Cl. 425-383.000.

Bunkley, Rex L.; and Powanda, Thomas M., to Celanese Corporation. Protective colloids from alcoholysis products of polyalcohols and polyacrylate esters. 4,031,053, Cl. 260-29.6RW.

Bunnell, Edward Dennman, to AMP Incorporated. Electrical connector junction for carpeted floor. 4,030,801, Cl. 339-121.000.

Burger, William R.: *See—*
Christou, Kyriakos; Kruklitis, Karlis; and Burger, William R., 4,031,359.

Burkey, John K.: *See—*
McClain, Herbert D.; Parikh, Bipin D.; and Burkey, John K., 4,031,317.

Burns & Russell Company, The: *See—*
McClinton, John L., 4,031,282.

Burns & Russell Company of Baltimore City, The: *See—*
Sergovic, John A., 4,031,289.

Burroughs Corporation: *See—*
Christou, Kyriakos; Kruklitis, Karlis; and Burger, William R., 4,031,359.
Faber, Ulbe, 4,031,512.
Holz, George E.; and Ogle, James A., 4,031,429.
Reed, John Anthony; and Karp, Joel Allen, 4,031,522.
Wallace, Harry L.; and Templeton, William B., 4,030,728.

Burroughs Wellcome Co.: *See—*
Easterbrook, Michael George, 4,031,214.
Richards, William Henry George, 4,031,220.

Burrus, Harry Otto, to Du Pont de Nemours, E. I., and Company. Process for producing hydrogen fluoride. 4,031,191, Cl. 423-485.000.

Burt, Terry L. Hard safety hat. 4,030,140, Cl. 2-410.000.

Burton, Clyde L.: *See—*
Tennes, Bernard R.; and Burton, Clyde L., 4,030,244.

Bush, Richard Wayne, to W. R. Grace & Co. Alkali-resistant radiation curable ene-thiol compositions. 4,031,271, Cl. 427-43.000.

Butin, Henri; and Deman, Pierre, to Thomson-CSF. Telephone set and system utilizing frequency division multiplexing. 4,031,327, Cl. 179-15.0FD.

Buttner, Karl; Boll, Jurgen; and Wolfel, Kurt, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Installation for preparing cable lengths for plug extrusion. 4,030,174, Cl. 29-33.00M.

Buzzi, Leo; Buzzi, Valentin; Opietnik, Walter; Liebl, Helmut; and Malobabic, Peter, to U.S. Philips Corporation. Apparatus driven by an electric motor. 4,030,573, Cl. 188-1.00B.

Buzzi, Valentin: *See—*
Buzzi, Leo; Buzzi, Valentin; Opietnik, Walter; Liebl, Helmut; and Malobabic, Peter, 4,030,573.

C O Oberg & Co AB: *See—*
Nilsson, Sven A.; and Melin, Christian, 4,030,382.

C. S. Oosterberg (Proprietary) Limited: *See—*
Oosterberg, Cedric Siegfried, 4,031,352.

Cacciola, Michael John; and Mjolsnes, Leonard Olaf, to Boeing Company, The. Torque limiter. 4,030,578, Cl. 188-134.000.

Caesar, Arndt Christian: *See—*
Tatzel, Hermann; Koegel, Wolfram; Beck, Gilbert; Zuern, Ludwig; and Caesar, Arndt Christian, 4,031,179.

Calculus Instruments Ltd.: *See—*
Tessler, Arthur N., 4,030,505.

Callis, James B.; and Davidson, Ernest R., to Research Corporation. Video fluorometer. 4,031,398, Cl. 250-458.000.

Cambridge Filter Corporation: *See—*
Noll, Robert W., 4,030,358.

Campanella, Samuel Joseph; Dodel, Hans; and Suyderhoud, Henri George, to Communications Satellite Corporation (COMSAT). Echo suppressor using frequency-selective center clipping. 4,031,338, Cl. 179-170.800.

Campbell, Alfred, to Parke, Davis & Company. Tetrapeptides. 4,031,072, Cl. 260-112.5LH.

Canada Packers Limited: *See—*
D'Souza, Godfrey B., 4,031,354.

Canon Kabushiki Kaisha: *See—*
Goshima, Takeshi; and Mochizuki, Noritaka, 4,030,806.
Hanagata, Takayoshi; Gushima, Hideki; and Seki, Mitsuaki, 4,030,588.
Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 4,031,383.
Takahashi, Toru; Nakahata, Kimio; and Kadowaki, Hidejiro, 4,030,447.

Cantello, Barrie Christian Charles: *See—*
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 4,031,099.

Cantor, Stephen E., to Uniroyal Inc. Non-migratory sulfonyl azide antioxidants. 4,031,068, Cl. 260-79.30R.

Caputo, William R., to Westinghouse Electric Corporation. Elevator system. 4,030,570, Cl. 187-29.00R.

Carbonnel, Henri, to Groupement pour les Activities Atomiques et Advancees "GAAA" S.A. Device for adjusting the quantity of molten metal used in pressure casting. 4,030,538, Cl. 164-312.000.

Cardillo, Mark J., to Massachusetts Institute of Technology. Method and apparatus for separating isotopes. 4,031,397, Cl. 250-423.00P.

Carini, Eugene P. Flywheel drive system. 4,031,420, Cl. 310-74.000.

Carl Zeiss-Stiftung, Carl Zeiss: *See—*
Hornschu, Joachim; and Jung, Arthur, 4,030,808.

Carlini, Filippo Maria: *See—*
Pieri, Giampiero; Carlini, Filippo Maria; Paffoni, Camillo; and Boffa, Gioacchino, 4,031,096.

Carmien, Joseph Allen, to Nupla Corporation. Adapter for fiberglass tool handles and other fiberglass connections. 4,030,847, Cl. 403-263.000.

Carpenter, John F.: *See—*
Hildebrand, Larry R.; and Carpenter, John F., 4,030,604.

Carpenter Technology Corporation: *See—*
Muzyka, Donald R.; and Walley, Robert F., 4,030,946.

Caruso, Frank, to United States of America, Army. Apparatus for electronically locating analog signals. 4,031,501, Cl. 340-6.00R.

Carver, Fred F.; and Hoyt, Carl E., to Singer Company, The. Seat vibration system for simulating aircraft buffeting. 4,030,208, Cl. 35-12.00F.

Carver, Phyllis. Illuminatable umbrella. 4,031,381, Cl. 240-6.420.

Casagrande, Fulvio: *See—*
Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, 4,031,248.

Cascade Industries, Incorporated: *See—*
West, Robert E., 4,030,304.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,031,515.
Kashio, Toshio, 4,031,516.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Schnee, Karl; Tichy, Dieter; and Piesch, Steffen, 4,031,064.

Castellion, George Augustus: *See—*
Schmitt, Joseph Lawrence, Jr.; Walker, Philip Leroy, Jr.; and Castellion, George Augustus, 4,031,137.

Castellucci, Nicholas T. Table tennis game apparatus having multi-rebound surfaces. 4,030,734, Cl. 273-30.000.

Castle, Henry H.: *See—*
Pilkington, Ted S.; and Castle, Henry H., 4,030,146.

Caterpillar Tractor Co.: *See—*
Belke, William H.; and Hafele, Joseph C., 4,030,816.

Bridwell, John W.; Hopkins, Donald L.; and Lohbauer, Kenneth R., 4,030,623.

Cobb, Delwin E.; Jackson, George J.; Livesay, Richard E.; and Stemler, Orrin A., 4,030,566.

Davis, Warren Wiley; and Keedy, David Edward, 4,030,288.

Heinold, Lloyd K., 4,030,568.

Keske, Frank E., 4,030,377.

Maguire, Roy L., 4,030,730.

Moring, Rodger L.; and Frauenhoff, Richard E., 4,030,575.

Catherall, Reginald, to Bell & Howell Limited. Generation of mathematical functions. 4,031,370, Cl. 235-152.000.

Caughey, Robert A. Apparatus for producing combustible gases from carbonaceous materials. 4,030,895, Cl. 48-111.000.

Celanese Corporation: *See—*
Bunkley, Rex L.; and Powanda, Thomas M., 4,031,053.
Collins, George L.; and Costanza, John R., 4,030,444.
Conciatori, Anthony B.; and Stackman, Robert W., 4,030,933.
Conciatori, Anthony B.; and Stackman, Robert W., 4,031,063.
DeMartino, Ronald N., 4,031,305.
DeMartino, Ronald N.; and Conciatori, Anthony B., 4,031,306.
DeMartino, Ronald N.; and Conciatori, Anthony B., 4,031,307.
Reader, Arthur M., 4,031,035.

Cella, Richard Joseph, Jr., to Du Pont de Nemours, E. I., and Company. Hot melt sealants. 4,031,058, Cl. 260-33.8UA.

Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Antibiotics produced by species of pseudonocardia. 4,031,206, Cl. 424-117.000.

Centoducati, Nicholas J. Windshield wiper blade liner. 4,030,159, Cl. 15-250.420.

Central Glass Co., Ltd.: *See—*
Nagae, Yasuyuki, 4,030,902.

Ceskoslovenska akademie ved: *See—*
Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, 4,030,944.

Chachin, Viktor Nikolaevich; Zhuravsky, Alexandr Julyanovich; Zdor, Gennady Nikolaevich; Shaduya, Vladimir Leontievich; and Golovkina, Elena Yakovlevna. Device for electrical discharge forming. 4,030,329, Cl. 72-56.000.

Chambers, Ren W., to Deco Industries. Scrap-tire feeding and coking process. 4,030,984, Cl. 201-25.000.

Chambers, Virginia Edith May: *See—*
Bayly, Russell James; Chambers, Virginia Edith May; and Monks, Reginald, 4,030,886.

Champion Spark Plug Company: *See—*
Smith, Gary C., Jr., 4,030,857.

Chandler Evans Inc.: *See—*
Kampe, Robert F., 4,030,289.

Chang, Shih-Chia, to General Monitors, Inc. Hydrogen gas detector. 4,030,340, Cl. 73-23.000.

Chapman, Derek David, to Eastman Kodak Company. Silver halide sensitized with dyes containing an isoindole nucleus. 4,030,932, Cl. 96-127.000.

Chaput, Reynald. Collapsible sawhorse package. 4,030,565, Cl. 182-151.000.

Chari, Madabushi V. K.: *See—*
Armor, Anthony F.; Chari, Madabushi V. K.; Kudlacik, Henry W.; and Reece, Paul, 4,031,422.

Charles Stark Draper Laboratory, Inc., The: *See—*
Oberbeck, George A., 4,031,457.

Chateau, Louis, to Ducellier & Cie. Electronic ignition circuit. 4,030,469, Cl. 123-148.00E.

Chazan, Jean-Bernard; and Gasc, Jean-Claude, to Roussel-UCLAF. Antibiotic aminoglycosides, processes of preparation and pharmaceutical compositions. 4,031,210, Cl. 424-180.000.

Cheers, Ronald Murray: *See—*
Poe, Curtis Eugene; and Cheers, Ronald Murray, 4,030,542.

Chem Systems Inc.: *See—*
Espino, Ramon L.; and Pletzke, Thomas S., 4,031,123.

Chemplex Company: *See—*
Pullukat, Thomas J., 4,031,298.

Chen, Che Jen: *See—*
Russell, Gary R.; Chen, Che Jen; and Harstad, Kenneth G., 4,031,389.

Chenausky, Peter P.: *See—*
Freiberg, Robert J.; Fradin, David W.; Chenausky, Peter P.; and Biancardi, Frank R., 4,031,484.

Chevron Research Company: *See—*
Kobzina, John W., 4,030,906.
Kurkov, Victor P., 4,031,114.
Kurkov, Victor P., 4,031,115.
Magee, Philip S., 4,031,247.

Chiba, Tomosuke: *See—*
Sumiyoshi, Hiroji; and Chiba, Tomosuke, 4,031,553.

Chicago Pneumatic Tool Company: *See—*
Marcantonio, Livio F., 4,030,254.

Chierici, Osvaldo F., to Holland Company. Uncoupling lever arrangement for railroad cars with standard draft gear cushioning. 4,030,613, Cl. 213-166.000.

Chimeno, Jose-Alfonso Canicio, to Laboratorios Hermes, S.A. 3-(N-2', 6'xylyl)-carboxamide pyridone-2. 4,031,105, Cl. 260-295.5GA.

Chitil, Manfred; and Hubatsch, Gotthard, to Klockner-Werke AG. Arrangement for producing steel. 4,031,309, Cl. 13-10.000.

Chou, Ta-Sen, to Eli Lilly and Company. Process for preparing 3-acyloxymethyl-2-cephem compounds. 4,031,082, Cl. 260-243.00C.

Christensen, Donald L.: *See—*
McCord, Andrew T., 4,031,184.

Christian, Edward H.; Mains, Donald M.; and Treiber, James H., to Bucyrus-Erie Company. Transient load damping circuit for excavator. 4,031,440, Cl. 318-432.000.

Christofer, Donald E.: *See—*
Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., 4,030,708.

Christopherson, Herman P., to Toro Company, The. Mower rear shield structure. 4,030,277, Cl. 56-320.100.

Christou, Kyriakos; Kruklitis, Karlis; and Burger, William R., to Burroughs Corporation. Straight line read system. 4,031,359, Cl. 235-61.11D.

Chu, Joseph Y. C.; and Gunther, W. H. H., to Xerox Corporation. Process for preparation of solid phase dispersion of photoconductive materials. 4,030,991, Cl. 204-158.00R.

Chu, Joseph Y. C.; and Gunther, W. H. H., to Xerox Corporation. Process for preparation of a solid phase dispersion of photoconductive materials. 4,030,992, Cl. 204-158.00R.

Chu, Joseph Y. C.; and Gunther, W. H. H., to Xerox Corporation. Process for preparation of solid phase dispersion of photoconductive materials. 4,030,993, Cl. 204-158.00R.

Chugai, Alexei Dmitrievich: *See—*
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.

Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna. Method of producing fine disperse alkylated silica compounds. 4,030,940, Cl. 106-308.00Q.

Churchill, Steven T., to Letot, Incorporated. Telephone operated signalling system. 4,031,322, Cl. 179-2.00A.

Ciarico, Anthony J.: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,030,497.

Ciba-Geigy AG: *See—*
Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, 4,031,248.

Ciba-Geigy Corporation: *See—*
Mory, Rudolf; and Hari, Stefan, 4,031,073.
Ramey, Chester E.; and Luzzi, John J., 4,031,095.
Reinert, Gerhard; Fallows, Jack; and Dussy, Paul, 4,031,273.
Schmitter, Andre; and Seiz, Wolfgang, 4,031,043.

Cincinnati Milacron-Heald Corporation: *See—*
St. Andre, Arthur Francis; LeBlanc, Joseph David; and Robillard, Edward George, 4,031,446.

Cities Service Company: *See—*
Bouck, Larry S., 4,030,549.
Sierra, Austin V., Jr., 4,031,007.

Citizen Watch Co., Ltd.: *See—*
Ebihara, Heihachiro, 4,030,338.

Citrin, Paul S.; and Gurski, Frank, to Indicon Inc. Method and apparatus for dispensing viscous materials. 4,030,640, Cl. 222-207.000.

Clark Equipment Company: *See—*
Bricknell, William H.; and Sunderlage, Gerald N., 4,030,776.

Clark, James Monroe, to International Telephone and Telegraph Corporation. Digital phase/frequency comparator. 4,031,478, Cl. 328-134.000.

Clark, William T., III. Embolectomy catheter. 4,030,503, Cl. 128-304.000.

Claudius Peters AG: *See—*
Bode, Herbert, 4,030,206.

Clifton, Doris V.: *See—*
Clifton, Howard J.; and Clifton, Doris V., 4,030,814.

Clifton, Howard J.; and Clifton, Doris V. Recipe magnifier and viewer. 4,030,814, Cl. 350-238.000.

Cluzel, Philippe; Quivy, Michel; and Tocquet, Bernard, to Etat Francais. Low frequency acoustical piezo-electric transducer. 4,031,418, Cl. 310-8.200.

Cobb, Delwin E.; Jackson, George J.; Livesay, Richard E.; and Stemler, Orrin A., to Caterpillar Tractor Co. Hydraulic system for rock breaker. 4,030,566, Cl. 184-6.200.

Cobb, John Farley, to Whirlpool Corporation. Mold apparatus. 4,030,871, Cl. 425-388.000.

Cochran, Chudleigh B.: *See—*
Rogers, Jerry L.; and Cochran, Chudleigh B., 4,030,546.

Cody, David L., to Symons Corporation. Invertable, multi-purpose structural clamp. 4,030,266, Cl. 403-405.000.

Colding, Bertil; Novak, Arne; Sandstrom, Unto; and Jakobsson, Goran, to Verkstadsteknik AB. Adaptive control of cutting machining operations. 4,031,368, Cl. 235-151.110.

Cole, Edward L.: *See—*
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,030,981.

Cole, Paul Morrison, to Du Pont de Nemours, E. I., and Company. Method and apparatus for traversing a strand to form a restrained web. 4,030,168, Cl. 28-101.000.

Coleman, Allan; and Macklin, Bernard, to Electrical Conductors, Inc. Weatherproof enclosure for electrical wiring devices. 4,031,312, Cl. 174-52.00R.

Coleman, Bob G., to Babcock & Wilcox Company, The. Ceramic cap for insulation anchor. 4,030,261, Cl. 52-511.000.

Coles, Otis C., Jr. Multi-stage rabbit. 4,030,858, Cl. 417-56.000.

Colinet, Andre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Lever operated control device. 4,030,379, Cl. 74-522.000.

Collins, Charles P.; and Lampietti, Bernard P., to Torin Corporation. Spring coiling machine with improved drive means. 4,030,327, Cl. 72-23.000.

Collins, George L.; and Costanza, John R., to Celanese Corporation. Continuous silk screen with direct roll coater. 4,030,444, Cl. 118-257.000.

Collins, Joseph C.; and Diana, Guy D., to Sterling Drug Inc. Aryloxyalkyl diketones. 4,031,246, Cl. 424-331.000.

Colonnelli, Domenico: *See—*
Raggiotti, Guglielmo; and Colonnelli, Domenico, 4,031,365.

Colorguard Corporation: *See—*
Ingraham, Glen E., 4,031,284.

Colter, John Cecil; James, Dean B.; Keith, Walter Gill; and Akbari-Kenari, Reza, to General Electric Company. Process for producing uranium oxide rich compositions from uranium hexafluoride using fluid injection into the reaction zone. 4,031,029, Cl. 252-301.10R.

Combustion Engineering, Inc.: *See—*
Anthony, Andrew James; and Hutchinson, John Jefferson, 4,030,975.
Groves, Malcolm Duane, 4,030,972.

Commissariat a l'Energie Atomique: *See—*
Audaire, Luc; Borel, Joseph; Le Goascoz, Vincent; and Poujois, Robert, 4,031,380.
Baudoin, Jean-Claude; and Oger, Robert, 4,030,376.
Borel, Joseph; and Robert, Jacques, 4,031,529.

Communications Satellite Corporation (COMSAT): *See—*
Campanella, Samuel Joseph; Dodel, Hans; and Suyderhoud, Henri George, 4,031,338.

Compagnie Generale d'Electroceramique: *See—*
Auriol, Alain; and Tritten, Paul, 4,031,177.

Compagnie Honeywell Bull (Societe Anonyme): *See—*
Droux, Jacques Pierre Leon; and Rodier, Rene Jean, 4,031,443.

Compagnie Industrielle des Telecommunications Cit-Alcatel SA: *See—*
Parent, Guy, 4,031,500.

Compagnie Internationale pour l'Informatique: *See—*
Lazzari, Jean-Pierre, 4,030,189.

Conceptual Products, Inc.: *See—*
Walters, William T.; and Parlette, Marvin D., Jr., 4,030,493.

Conciatori, Anthony B.; and Stackman, Robert W., to Celanese Corporation. Phosphorus and halogen containing polymers of bis-hydroxyethyl terephthalate as flame retardant additives. 4,030,933, Cl. 106-15.0FP.

Conciatori, Anthony B.; and Stackman, Robert W., to Celanese Corporation. Polyester resin compositions. 4,031,063, Cl. 260-860.000.

Conciatori, Anthony B.: *See—*
DeMartino, Ronald N.; and Conciatori, Anthony B., 4,031,306.
DeMartino, Ronald N.; and Conciatori, Anthony B., 4,031,307.

Concrete Cutting Equipment Inc.: *See—*
Dempsey, Edward Justin; and Kent, David Earl, 4,031,437.

Condit, Paul Brainard: *See—*
Kuh, Arthur David; and Condit, Paul Brainard, 4,030,920.

Conn, Thomas E.; and Grilli, Victor J., to Beckman Instruments, Inc. Tube adaptor for centrifuge rotor bucket. 4,030,663, Cl. 233-26.000.

Connelly Containers, Inc.: *See—*
Heaps, Harry D., 4,030,600.

Connor, Donald E.: *See—*
Boetto, Charles; Orkwiszewski, Wayne L.; and Connor, Donald E., 4,030,551.

Consolidated-Bathurst Limited: *See—*
Goel, Krishan N.; and Walker, Osman J., 4,030,968.

Consolidation Coal Company: *See—*
Gorin, Everett; Jasulaitis, William A.; Theodore, Frank W.; and Wasson, George E., 4,030,982.

Construction Aggregates Corporation: *See—*
Sensibar, Ezra, 4,030,435.

Container Corporation of America: *See—*
Gardner, Jeffrey M., 4,030,659.
Rada, Joseph J.; and Gardner, Jeffrey M., 4,030,660.

Continental Oil Company: *See—*
Edmond, Tibor O.; and Dahl, H. Douglas, 4,030,345.
Fonseca, Anthony G., 4,030,917.
Keith, Thomas R., Jr., 4,030,370.

Contour Fabricators, Inc.: *See—*
Gabriele, William Joseph; and Gabriele, Joseph Michael, 4,030,719.

Contraves AG: *See—*
Stait, Donald Peter; and Zenger, Willi, 4,030,496.

Control Data Corporation: *See—*
Norberg, Gayle Russell, 4,031,463.
Norberg, Gayle Russell, 4,031,464.

Cook Electric Company: *See—*
Shylo, Paul, 4,031,332.

Cooksey, James Judson: *See—*
Weiss, William Robert; Cooksey, James Judson; Stables, Wilbur Leon; and Newell, Harry Lee, Jr., 4,030,651.

Cooper, Joseph E., to PPG Industries, Inc. Glass batch pelletizing method. 4,031,175, Cl. 264-40.700.

Copeland, Miles Alexander, to Northern Electric Company Limited. Analog signal processor. 4,031,490, Cl. 333-70.00T.

Corbett, Maury: *See—*
Linck, Donald W., II; and Kaprelian, George, 4,030,197.

Cordes, Claus; and Sterzel, Hans-Josef, to BASF Aktiengeseilschaft. Manufacture of thermoplastic polyester molding compositions of high viscosity. 4,031,065, Cl. 260-75.00R.

Corkin, Samuel, Jr. Calculating method and apparatus for handicapping thoroughbred races and the like. 4,031,376, Cl. 235-156.000.

Corning Glass Works: *See—*
Beckford, Orville A.; and Dauzickas, Helen F. B., 4,030,980.
Phillips, Jodie W., 4,030,173.
Phillips, Lawrence W.; and Rodgers, Harris G., Sr., 4,030,181.
Rittler, Hermann L., 4,030,903.
Sullivan, Kevin J., 4,030,341.

Corpus, Daniel J. M. Vapor injector for internal combustion engines. 4,030,456, Cl. 123-25.00B.

Costanza, John R.: *See—*
Collins, George L.; and Costanza, John R., 4,030,444.

Coupek, Jiri: *See—*
Kalal, Jaroslav; Coupek, Jiri; Pokorny, Svatopluk; Svec, Frantisek; and Bouchal, Karel, 4,031,037.

Couture, Joseph Walter, to Black Clawson Company, The. Apparatus for pulping waste paper materials. 4,030,671, Cl. 241-15.000.

Cram, Robert E.; Gill, Walter; and Loundagin, James A., to United States of America, Navy. Digital flow control system. 4,030,523, Cl. 137-599.000.

Crane, Robert Anthony; and Ghosh, Asoke Kumar, to RCA Corporation. Method for achieving gas dynamic lasing. 4,031,485, Cl. 331-94.50P.

Creighton, John Joseph. Non-return safety valve assembly and pressure pack incorporating same. 4,030,644, Cl. 222-396.000.

Cremer, George D.; and Long, John V., to International Harvester Company. Composite construction of metallic strips disposed in side-by-side relationship. 4,031,279, Cl. 428-44.000.

Crossley, Roger: *See—*
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,031,102.

Crowle, Brian, to RCA Corporation. Differential amplifier. 4,031,495, Cl. 330-30.00D.

Cullen, Walter P.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,031,206.

Curington, Alfred R.: *See—*
Kammerer, Archer W., Jr.; and Curington, Alfred R., 4,030,554.

Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, to John Wyeth & Brother Limited. Cyclopenteno[b]pyridine derivatives. 4,031,102, Cl. 260-294.80C.

Curtis Dyna Products Corporation: *See—*
Curtis, Russell R., 4,030,695.

Curtis, Russell R., to Curtis Dyna Products Corporation. Pulse fog generator. 4,030,695, Cl. 251-113.000.

Curtiss, Walter W., Jr., to Goodyear Tire & Rubber Company, The. Sidewall protector for a tire. 4,030,530, Cl. 152-187.000.

Custom Plastics, Inc.: *See—*
Tisbo, Cosmo N.; and Tisbo, Thomas A., 4,030,664.

Cutler, Cassius C.: *See—*
Bond, Walter L.; Cutler, Cassius C.; and Lemons, Ross A., 4,030,342.

Cyrus, Richard; and Raschack, Manfred, to Knoll A.G. Chemische Fabriken. 3-(3,4-Dialkoxy-benzyl)-3-methyl-piperazines. 4,031,216, Cl. 424-250.000.

D.C. Glass Ltd.: *See—*
Lacombe, Gaetan Y., 4,030,263.

D.N.S. Precision Machining: *See—*
Serlovsky, Frank V., 4,030,717.

D'Agostini, Candido: *See—*
Barba, Diego; Battistoni, Fabrizio; D'Agostini, Candido; and Macchi, Giorgio, 4,031,187.

Dahl, H. Douglas: *See—*
Edmond, Tibor O.; and Dahl, H. Douglas, 4,030,345.

Dahle, Orvar; von Knorring, Folke; and Siby, Sture, to ASEA Aktieboiag. Magnetoelastic transducer arrangement. 4,030,346, Cl. 73-88.50R.

Daimler-Benz Aktiengesellschaft: *See—*
Frey, Jurgen; Weber, Andreas; and Triffterer, Adolf, 4,030,463.
Kleinschmit, Einhard; Tattermusch, Peter; and Haverbeck, Gunther, 4,030,714.
Meixner, Rudolf; and Kling, Gunter, 4,030,773.
Schwuchow, Norbert; and Hutai, Hubert, 4,030,744.
Stute, Manfred; and Tank, Eggert, 4,030,539.

Daley, Thomas G. Method of making an object support member. 4,030,187, Cl. 29-458.000.

Dalle, Jean-Paul: *See—*
Vaesken, Maryvonne J.; Bultez, Alain E.; and Dalle, Jean-Paul, 4,030,883.

Daller, Hans. Dart. 4,030,761, Cl. 273-106.50A.

Damon, Neil F.: *See—*
Hanlon, Richard J.; Damon, Neil F.; and Yeo, Herbert G., 4,030,793.

D'Angelo, John: *See—*
Berkowitz, Sidney; and D'Angelo, John, 4,031,091.

Danielli, Franco: *See—*
Possati, Mario; and Danielli, Franco, 4,030,201.

Danneberg, Peter: *See—*
Koppe, Herbert; Zeile, Karl; Kummer, Werner; Stahle, Helmut; and Danneberg, Peter, 4,031,244.

Danowski, Edwin K., to General Converters & Assemblers, Inc. Tiddlywinks game. 4,030,760, Cl. 273-95.00E.

Danzig, William: *See—*
Linck, Donald W., II; and Kaprelian, George, 4,030,197.

Das, Manik L., to Sigma Chemical Company. Bilirubin determination. 4,030,885, Cl. 23-230.00B.

Daswick, Alexander C. Sporting shoe. 4,030,213, Cl. 36-30.00R.

Datta, Amitava: *See—*
Shilling, Jack W.; Datta, Amitava; and Malagari, Frank A., Jr., 4,030,950.

Dauzickas, Helen F. B.: *See—*
Beckford, Orville A.; and Dauzickas, Helen F. B., 4,030,980.

Davidson, Charles Patrick Duncan: *See—*
Leighton, Peter Watson; and Davidson, Charles Patrick Duncan, 4,030,562.

Davidson, Ernest R.: *See—*
Callis, James B.; and Davidson, Ernest R., 4,031,398.

Davidson, Richard W.: *See—*
Rando, Joseph F.; Sobel, Arthur; and Davidson, Richard W., 4,030,832.

Davis, Eldon, to Norden Laboratories, Inc. Feline viral rhinotracheitis vaccine and combination feline viral rhinotracheitis-calicivirus vaccine prepared therefrom. 4,031,204, Cl. 424-90.000.

Davis, Guy E., to Westinghouse Electric Corporation. System for manually or automatically transferring control between computers without power generation disturbance in an electric power plant or steam turbine operated by a multiple computer control system. 4,031,372, Cl. 235-151.210.

Davis, Warren Wiley; and Keedy, David Edward, to Caterpillar Tractor Co. Modular gas turbine engine assembly. 4,030,288, Cl. 60-39.16R.

de la Teja, Elpidio Leoncio: *See—*
Reid, Joanne; de la Teja, Elpidio Leoncio; and Farrell, Francis, 4,031,238.

Dean, Almeta C. Building panel connector assembly and the like. 4,030,262, Cl. 52-583.000.

Dean, Malcoim: *See—*
Bailey, Alfred J.; and Dean, Malcoim, 4,030,641.

deBenneville, Peter, to Rohm and Haas Company. Arylaminoalkylthioamides. 4,031,186, Cl. 424-324.000.

Deboffles, Regis Pierre. Loading apparatus. 4,030,593, Cl. 198-308.000.

Deckert, Dennis D. Toothbrush with self-contained dentifrice and disposable handle. 4,030,845, Cl. 401-268.000.

Deco Industries: *See—*
Chambers, Ren W., 4,030,984.

Deere & Company: *See—*
Reiner, Carl Casper, 4,031,461.

Defibrator AB: *See—*
Asplund, Arne Johan Arthur; Reinhall, Rolf Bertil; and Ahrel, Per Johan Ingemar, 4,030,969.

Deinlein-Kalb, Hans, to AEG-Kanis Turbinenfabrik GmbH. Hydraulic device for rotating a turbine. 4,030,296, Cl. 60-486.000.

de Jong, Eduard: *See—*
Raabe, Fritz; and de Jong, Eduard, 4,030,957.

deJongh, Hendrik Paul; and van Bokhoven, Cornelis Wilhelmus, to Akzona Incorporated. Process for the preparation of 11β-hydroxy-18-alkyl-estrane compounds. 4,031,074, Cl. 260-239.55C.

Del Laboratories, Inc.: *See—*
Lench, Jack; and Ferrari, Luigi M., 4,030,844.

Delalande S.A.: *See—*
Fauran, Claude P.; Bourgery, Guy R.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,031,089.

Delbar Products, Inc.: *See—*
Szilagyi, Jane M., 4,030,692.

Del Castillo, Juan M. Chord playing attachment for a stringed instrument. 4,030,400, Cl. 84-317.000.

Delcayre, Guy, to Anvar Agence Nationale de Valorisation de la Recherche. Electronic equipment for radio control of fencing bouts. 4,030,731, Cl. 273-1.00F.

Delhaye, Michel; Moschetto, Yves J. M.; and Dhamelincourt, Paul, to Institut National de la Sante et de la Recherche Medicale (Inserm). Apparatus for the non-destructive examination of heterogeneous samples. 4,030,827, Cl. 356-75.000.

De Lind Van Wijngaarden, Gerhard: *See—*
Berger, Hans; De Lind Van Wijngaarden, Gerhard; and Breuker, Jacobus H., 4,031,016.

DelPesco, Thomas Wayne, to Du Pont de Nemours, E. I., and Company. Synthesis of aromatic amines by reaction of aromatic compounds with ammonia. 4,031,106, Cl. 260-296.00R.

Deman, Pierre, to Thomson-CSF. Telephone artery with multiple access points and telephone networks with such arteries. 4,031,326, Cl. 179-15.0FS.

Deman, Pierre: *See—*
Butin, Henri; and Deman, Pierre, 4,031,327.

DeMartino, Ronald N., to Celanese Corporation. Polygalactomannan ether compositions. 4,031,305, Cl. 536-114.000.

DeMartino, Ronald N.; and Conciatori, Anthony B., to Celanese Corporation. Polygalactomannan allyl ether compositions. 4,031,306, Cl. 536-114.000.

DeMartino, Ronald N.; and Conciatori, Anthony B., to Celanese Corporation. Cationic polygalactomannan compositions. 4,031,307, Cl. 536-114.000.

Deming, Philip H. Magnetic toner compositions. 4,031,021, Cl. 252-62.10P.
Deml, Reinhold: *See—*
Wick, Richard; Bestenreiner, Friedrich; Deml, Reinhold; and Helmberger, Josef, 4,031,550.
Dempsey, Edward Justin; and Kent, David Earl, to Concrete Cutting Equipment Inc. Work and feed control system for cutting machines. 4,031,437, Cl. 318-39.000.
Der, James J., to United States of America, Navy. Controllable sorbent broadcaster. 4,031,005, Cl. 209-236.000.
De Rijke, Pieter Adrianus: *See—*
Schampers, Paulus Philippus Maria; and De Rijke, Pieter Adrianus, 4,030,789.
Derr, Josiah F. Golf club with aligning means. 4,030,766, Cl. 273-163.00R.
Desai, Samir Thakorbhai, to Motorola, Inc. Single control power-frequency control circuit. 4,031,319, Cl. 179-1.00D.
Desert Sunshine Exposure Tests, Inc.: *See—*
Zerlaut, Gene A.; and Heiskell, Robert F., 4,031,385.
Deutsch, Ralph; and Griffith, Glen R., to Nippon Gakki Seizo Kabushiki Kaisha. Fast multiplier circuit employing shift circuitry responsive to two binary numbers the sum of which approximately equals the material of the multiplier. 4,031,377, Cl. 235-164.000.
DeVries, Hubert G., to Monolithic Systems Corporation. Microcomputer board having wire-wrap terminals. 4,031,371, Cl. 235-152.000.
Dhamelincourt, Paul: *See—*
Delhaye, Michel; Moschetto, Yves J. M.; and Dhamelincourt, Paul, 4,030,827.
Dhami, Kewal Singh: *See—*
Aronoff, Elihu J.; and Dhami, Kewal Singh, 4,031,167.
Dhein, Rolf; Zabrocki, Karl; Beer, Wolfgang; and Kuchenmeister, Rolf, to Bayer Aktiengesellschaft. Non-aqueous stoving lacquers containing e-caprolactam as reactive diluent. 4,031,047, Cl. 260-21.000.
Dhein, Rolf; Schoeps, Jochen; and Kuchenmeister, Rolf, to Bayer Aktiengesellschaft. Aqueous stoving lacquer containing e-caprolactam as a reactive diluent. 4,031,052, Cl. 260-29.40R.
Diagraph-Bradley Industries, Inc.: *See—*
Lampman, Duncan L., 4,030,592.
Diamond International Corporation: *See—*
Keen, Everett M.; and Siciliano, Anthony J., 4,030,452.
Diana, Guy D.: *See—*
Collins, Joseph C.; and Diana, Guy D., 4,031,246.
Di Bella, Eugene P., to Tenneco Chemicals, Inc. Chlorination of toluene. 4,031,144, Cl. 260-650.00R.
Di Bella, Eugene P., to Tenneco Chemicals, Inc. Process for the production of 3,4-dichlorotoluene. 4,031,145, Cl. 260-650.00R.
Di Bella, Eugene P., to Tenneco Chemicals, Inc. Process for the production of 2,5-dichlorotoluene. 4,031,146, Cl. 260-650.00R.
Didier Engineering GmbH: *See—*
Beck, Kurt Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, 4,030,983.
Diebold, Incorporated: *See—*
Anders, Walter G., 4,030,258.
Dietrich, Theo: *See—*
Heinroth, Karl-August; Dietrich, Theo; Bach, Hans; and Jurischka, Hans-Dieter, 4,030,278.
Diggs, Richard E. Solar power system. 4,030,890, Cl. 23-281.000.
di Marco, Aurelio: *See—*
Patelli, Bianca; Bernardi, Luigi; Arcamone, Federico; and di Marco, Aurelio, 4,031,211.
Dimeff, John. Self-calibrating radiometer. 4,030,362, Cl. 73-355.0EM.
Diorio, Frank: *See—*
Regber, Norman; Dukic, Ferdinando V.; and Diorio, Frank, 4,030,418.
Dishon, Giora: *See—*
Schieber, Michael M.; Beinglass, Israel; and Dishon, Giora, 4,030,964.
Dissauer, Gerald Anthony: *See—*
Holloran, Thomas Patrick; Braden, Arthur Buell; Foley, Jerrold Stokes; Maynard, James Lucian; Klosky, John Patrick; Dissauer, Gerald Anthony; Adams, Terrence Miller; and Lorenz, Allan Alfred, 4,031,518.
Dittmar, Wilfried, to WERSI-electronic GmbH & Co. Kommanditgesellschaft fur elektronische Gerate und elektronische Bauelemente. Electronic musical instrument. 4,030,398, Cl. 84-1.260.
Dlugos, Daniel F.; and Manduley, Flavio M., to Pitney-Bowes, Inc. Stream feed detector for detecting document spacing. 4,031,402, Cl. 250-557.000.
Dr. Johannes Heidenhain GmbH: *See—*
Spies, Alfons, 4,030,282.
Dodel, Hans: *See—*
Campanella, Samuel Joseph; Dodel, Hans; and Suyderhoud, Henri George, 4,031,338.
Dolidze, Vladimir Alexandrovich: *See—*
Shults, Mikhail Mikhailovich; Parfenov, Anatoly Ivanovich; Shnypikov, Alexandr Dmitrievich; Krunchak, Vladimir Georgievich; Evnina, Sarra Borisovna; Dolidze, Vladimir Alexandrovich; and Tarasova, Valentina Mikhailovna, 4,030,935.
Dolnakov, Jury Pavlovich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.
Dombrowski, Frank R.; and Larson, Raymond L., to General Electric Company. Method for stripping windings from a stator. 4,030,184, Cl. 29-403.000.
Doncheva, Zvetana Semkova: *See—*
Arolski, Angel Tomov; Usheva, Velichka Borissova; Gruev, Peter Vassilev; Richev, Georgi Trendafilov; and Doncheva, Zvetana Semkova, 4,031,264.
Donovan, John E., to Package Exhibit Programs, Inc. Portable display apparatus. 4,030,219, Cl. 40-130.00R.
Doobenen, William; and Hennessy, Robert Thomas. Gun lock using manual pressure. 4,030,221, Cl. 42-1.00Y.
Dorey, Roger John: *See—*
Battye, Christopher John; and Dorey, Roger John, 4,030,904.
Dorgathen, Friedrich, to Montanus Industrieanlagen GmbH. Magnetic filter apparatus. 4,031,011, Cl. 210-222.000.
Dorme, Nicole A. M.: *See—*
Fauran, Claude P.; Bourgery, Guy R.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,031,089.
Dorph, Thor, to Lie, Bjorn; and Lie, Gina. Line guide for a fishing rod. 4,030,224, Cl. 43-24.000.
Dose, Gerhard: *See—*
Hoffmeister, Bernhard; and Dose, Gerhard, 4,030,973.
Dover Corporation: *See—*
McMath, Jack Alan; Wilder, Paul R.; and Alderson, Larry Lee, 4,030,524.
Dow Chemical Company, The: *See—*
Giacobbe, Thomas J., 4,031,100.
Griffin, Thomas J., Jr., 4,031,014.
Grinstead, Robert R.; and Nasutavicus, Wilmonte A., 4,031,038.
Johnston, Howard, 4,030,910.
Dow Corning Corporation: *See—*
Brown, Paul L., 4,031,121.
Brown, Paul L., 4,031,122.
Joslyn, Wallace G., 4,031,044.
Dowbenko, Rostyslaw; and Marchetti, Joseph R., to PPG Industries, Inc. Hydrolyzed reaction product of a polyepoxide with a phenolic compound having a group hydrolyzable to a carboxyl and curing agent therefor. 4,031,051, Cl. 260-29.2TN.
Dowbenko, Rostyslaw: *See—*
Anderson, Carl Clement; and Dowbenko, Rostyslaw, 4,031,290.
Doyle, Donald M. Nasal hemostat and method of construction of nasal hemostat. 4,030,504, Cl. 128-325.000.
Drabert Sohne: *See—*
Riedel, Dieter, 4,030,320.
Draftex Development AG: *See—*
Yeomans, Frederick G., 4,030,245.
Dragerwerk Aktiengesellschaft: *See—*
Simbruner, Georg, 4,030,492.
Drancourt, Claude, to Societe Presstub. Tube squeezing device. 4,030,636, Cl. 222-102.000.
Dreiding, Andre. Molecular models. 4,030,209, Cl. 35-18.00A.
Dresser, Thorpe: *See—*
Edison, Robert Raynold; and Dresser, Thorpe, 4,031,154.
Droll Yankees, Inc.: *See—*
Miller, Isobel, 4,030,451.
Droux, Jacques Pierre Leon; and Rodier, Rene Jean, to Compagnie Honeywell Bull (Societe Anonyme). Apparatus for positionally controlling a movable head assembly. 4,031,443, Cl. 318-561.000.
Drucker, Howard. Push toy. 4,030,243, Cl. 46-241.000.
DSO "Bulgarplod": *See—*
Arolski, Angel Tomov; Usheva, Velichka Borissova; Gruev, Peter Vassilev; Richev, Georgi Trendafilov; and Doncheva, Zvetana Semkova, 4,031,264.
D'Souza, Godfrey B., to Canada Packers Limited. Rotary heating apparatus for puffing borax. 4,031,354, Cl. 219-389.000.
Dubendorff, Joachim: *See—*
Wunnenberg, Klaus; and Dubendorff, Joachim, 4,030,531.
Ducanis, Paul. Bar stock guide arrangement for screw machines. 4,030,585, Cl. 193-38.000.
Ducellier & Cie: *See—*
Chateau, Louis, 4,030,469.
Dudley, Philip; Bower, Lewis Robert; and Wake, Malcolm, to Fletcher Sutcliffe Wild Limited. Mine roof supports. 4,030,308, Cl. 61-45.00D.
Dudonis, Ronald Michael, to Bell Telephone Laboratories, Incorporated. Automated coin arrangement providing interference free coin deposit detection during announcements. 4,031,324, Cl. 179-6.30R.
Dudonis, Ronald Michael; Morrison, Charles Glenn; Potter, Robert Lawrence; and Streisand, Kenneth, to Bell Telephone Laboratories, Incorporated. Called party fraud prevention in an automated coin system. 4,031,325, Cl. 179-6.30R.
Duembgen, Gerd: *See—*
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Lebert, Ulrich; and Thiessen, Fritz, 4,031,135.
Duennenberger, Max: *See—*
Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, 4,031,248.
Duffy, Brian J.: *See—*
Martin, Lawrence Leo; and Duffy, Brian J., 4,031,224.
Duisburger Kupferhutte: *See—*
Piret, Norbert L.; Rabben, Hans Joachim; Kudelka, Herbert; and Schmidt, Siegbert, 4,030,990.

Dukic, Ferdinando V.: *See—*
Regber, Norman; Dukic, Ferdinando V.; and Diorio, Frank, 4,030,418.
Dumanov, Ivan Minkov: *See—*
Kochemidov, Atanas Dimitrov; Makedonski, Boris Georgiev; Dumanov, Ivan Minkov; Payakov, Stefan Georgiev; Galabov, Peter Konstantinov; and Atanassov, Haralampi Aangelov, 4,030,249.
Duncan, Alexander Ritchie, to Molson Companies Limited, The. Filler tube. 4,030,529, Cl. 141-392.000.
Dunham-Bush, Inc.: *See—*
Schwarz, Leonard H., 4,030,179.
Dunn, Kathy A.: *See—*
Terzian, Rouben T.; Schoenfield, Palmer J.; Dunn, Kathy A.; and Kuna, Wayne A., 4,030,235.
Du Pont de Nemours, E. I., and Company: *See—*
Burrus, Harry Otto, 4,031,191.
Cella, Richard Joseph, Jr., 4,031,058.
Cole, Paul Morrison, 4,030,168.
DelPesco, Thomas Wayne, 4,031,106.
Fagan, Joseph P., 4,031,283.
Grot, Walther Gustav, 4,030,988.
Hackert, Raymond Leo, 4,031,060.
Holfeld, Winfried Thomas; and Strohmaier, Alfred John, 4,030,880.
Nottke, James E., 4,031,124.
Pedersen, Charles John; and Bromels, Marilyn H., 4,031,111.
Ramsey, Harold Eugene, 4,030,388.
Seymus, Herman Ernest, 4,031,286.
Sharkey, William Henry; and Harris, John Ferguson, Jr., 4,031,168.
Dupont, John A.; Kooch, Walter; and Scott, Joseph D., to Rohm and Haas Company. Metal compound stabilized coating compositions. 4,031,055, Cl. 260-29.6MM.
Duran, Hector Oscar. Pneumatic shock absorber for suspension of cars and/or similar vehicles. 4,030,715, Cl. 267-64.00R.
Durham, Harvey. Clamp for scoop loader. 4,030,626, Cl. 214-767.000.
Durling, Harold, to Midland-Ross Corporation. Tractor-mounted cargo-trailer brake control system. 4,030,757, Cl. 303-28.000.
Duro-Dyne Corporation: *See—*
Hinden, Milton; and Giannone, Charles, 4,031,350.
Durst AG Fabrik Fototechnischer Apparate Bozer: *See—*
Barbieri, Siegfried, 4,030,833.
Durst, Jack R., to Pillsbury Company, The. Preparation of fat-containing beverages. 4,031,261, Cl. 426-565.000.
Dushku, Victor A. Manually operated log breaking device. 4,030,700, Cl. 254-113.000.
Dussartre, Roger, to Jaeger. Device for correcting the law of deflection of an aneroid capsule. 4,030,367, Cl. 73-410.000.
Dussy, Paul: *See—*
Reinert, Gerhard; Fallows, Jack; and Dussy, Paul, 4,031,273.
Dwyer Instruments, Inc.: *See—*
Phillips, James W.; and Troyer, Terrance J., 4,030,365.
Dynamit Nobel Aktiengesellschaft: *See—*
Franz, Arnold; Huthwelker, Dirk; and Jacob, Lothar, 4,031,313.
Vollkommer, Norbert; and Trautvetter, Werner, 4,031,163.
E-Z Floss: *See—*
Russell, John R., 4,030,199.
Earley, Kenneth W. Detachable connector for securing a member to a fishing lure. 4,030,225, Cl. 43-42.090.
Earth Sciences, Inc.: *See—*
Loest, Kent W., 4,031,182.
Easterbrook, Michael George, to Burroughs Wellcome Co. Sulphonamide and 2,4-diaminopyrimidine injectable suspension. 4,031,214, Cl. 424-229.000.
Eastern Company, The: *See—*
Perron, Robert Richard; and Trombly, John E., 4,031,434.
Eastman, George. Apparatus for measuring deflection and temporal values on electrocardiac tracings. 4,030,486, Cl. 128-2.06R.
Eastman Kodak Company: *See—*
Blackwell, Samuel E., 4,030,882.
Chapman, Derek David, 4,030,932.
Kuh, Arthur David; and Condit, Paul Brainard, 4,030,920.
Leone, Ronald E.; Weber, Wayne W., II; and Wrathall, Donald P., 4,030,925.
Leone, Ronald E.; Weber, Wayne W., II; and Wrathall, Donald P., 4,031,127.
Ebauches S.A.: *See—*
Berney, Jean-Claude, 4,031,438.
Portmann, Hubert, 4,030,284.
Eberhardt, Noel H., to Micrema Incorporated. Push-button assembly switch for watches. 4,031,348, Cl. 200-159.00R.
Eberlein, Wolfgang: *See—*
Kutter, Eberhard; Austel, Volkhard; Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; Lillie, Christian; and Kadatz, Rudolf, 4,031,219.
Ebihara, Heihachiro, to Citizen Watch Co., Ltd. Timepiece testing apparatus. 4,030,338, Cl. 73-6.000.
Eccles, Anthony Garth: *See—*
Rodenchuk, William Simon; and Eccles, Anthony Garth, 4,030,536.
Echterhoff, Heinz: *See—*
Gemmeke, Wilfried; Werner, Heinrich; Echterhoff, Heinz; and Raulf, Erich, 4,031,189.
Eckhardt, Hellmuth, to Torrington GmbH. Felting needle. 4,030,170, Cl. 28-115.000.
Eckholt, Heinrich, to Hamel GmbH Zwirnmaschinen. Thread brake for double thread twister. 4,030,683, Cl. 242-149.000.
Eden, Edward Joseph, to Tekonsha Engineering Company. Magnetic dampened inertial sensor for brake and sway controls. 4,030,756, Cl. 303-24.00A.
Eden, Jamal S., to B. F. Goodrich Company, The. Low temperature catalytic combustion of chlorohydrocarbons. 4,031,149, Cl. 260-654.00A.
Edison, Robert Raynold; and Dresser, Thorpe, to Atlantic Richfield Company. Benzene by hydrogenative dealkylation. 4,031,154, Cl. 260-672.00R.
Edmond, Tibor O.; and Dahl, H. Douglas, to Continental Oil Company. Borehole pressure cell. 4,030,345, Cl. 73-88.00E.
Edo Western Corporation: *See—*
Lapetina, Robert Anthony, 4,031,544.
Edwards, Colin: *See—*
Pedlar, Roy; Spencer, Alan Roderick; and Edwards, Colin, 4,030,434.
Edwards, John A.: *See—*
Beard, Colin C.; Edwards, John A.; and Fried, John H., 4,031,234.
Edwards, Robert A. Remote indicating solid state magnetic sensor. 4,030,204, Cl. 33-361.000.
Edwards, William Joseph: *See—*
Martin, Adolph; and Edwards, William Joseph, 4,030,431.
Ehni, George John, III; and Leuschner, Horst, to Texas Instruments Incorporated. Solid state television channel selection system. 4,031,474, Cl. 325-455.000.
Ehrat, Kurt, to KESO AG. Lock. 4,030,325, Cl. 70-383.000.
Eidelberg, Jonah; and Mooney, Thomas, to I-T-E Imperial Corporation. Fitting for conduit and electrical cable. 4,030,742, Cl. 285-343.000.
Einstabland, Tomas Berge; and Opedal, Torlak, to Ingenior F. Selmer A/S. Apparatus for making inclined hollow concrete columns using sliding formwork. 4,030,864, Cl. 425-65.000.
Eisai Co., Ltd.: *See—*
Konishi, Toji, 4,031,205.
Eissfeldt, Werner. Apparatus for film and tape winding. 4,030,675, Cl. 242-55.180.
El-Antably, Samir M., to Mallinckrodt, Inc. 7-(2,3-Dihydroxypropyl-1,3-di-n-propylxanthine and a pharmaceutical composition containing same useful as a bronchial muscle relaxant. 4,031,218, Cl. 424-253.000.
Electrical Conductors, Inc.: *See—*
Coleman, Allan; and Macklin, Bernard, 4,031,312.
Electrical Power Research Institute: *See—*
Norris, Elwood B.; and Yeakley, Lester M., 4,030,347.
Electromedics, Inc.: *See—*
Halleck, Michael E., 4,030,363.
Electronic Data Controls Corporation: *See—*
Moreton, George C., 4,030,707.
Electrostatic Equipment Corporation: *See—*
Karr, Allan V., 4,030,446.
Eli Lilly and Company: *See—*
Bach, Nicholas J.; Hall, David A.; and Kornfeld, Edmund C., 4,031,097.
Chou, Ta-Sen, 4,031,082.
Kukolja, Stjepan; and Spry, Douglas O., 4,031,084.
O'Doherty, George O. P., 4,031,107.
Elitex, Zavody textilniho strojirenstvi, generalni reditalstvi: *See—*
Rambousek, Miroslav; Kapl, Ladislav; and Mladek, Milos, 4,030,279.
Elloy, Martin Arthur; and Beddow, Frank Howard, to National Research Development Corporation. Endoprosthetic bone joint devices. 4,030,143, Cl. 3-1.910.
Elser, Dieter, to Zahnradfabrik Friedrichshafen AG. Power steering with accumulator operation. 4,030,403, Cl. 91-448.000.
Elston, Lewis W., to Georgia Tech Research Institute. Regenerative method removal of sulfur dioxide from stack gases. 4,031,195, Cl. 423-554.000.
EMI Limited: *See—*
LeMay, Christopher Archibald Gordon, 4,031,395.
Empresa De Representaciones Unidas, S.A. (Erusa): *See—*
Rueda Segura, Eduardo, 4,031,353.
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Lebert, Ulrich; and Thiessen, Fritz, to BASF Aktiengesellschaft. Manufacture of acrylic acid by oxidation of propylene with oxygen-containing gases in two separate catalyst stages. 4,031,135, Cl. 260-530.00N.
Enneking, Heinrich; Schubert, Gunter; and Baumann, Karl-Heinz, to Industriewerke Karlsruhe Augsburg Aktiengesellschaft. Method and apparatus for treating yarn. 4,030,169, Cl. 28-220.000.
Enomoto, Masahiro, to AMP Incorporated. Electrical terminal. 4,030,804, Cl. 339-258.00S.
Enomoto, Shigeru, to Matsushita Electric Industrial Co., Ltd. Vertical deflection circuit. 4,031,430, Cl. 315-403.000.
Ernst, Horst M.; Olschewski, Armin; and Brandenstein, Manfred, to SKF Industrial Trading and Development Company, B.V. Device for linearly guiding a machine element. 4,030,191, Cl. 308-6.00C.
Eschenbach, Paul W.: *See—*
Brown, Robert Saul; Eschenbach, Paul W.; and King, Herbert Ray, 4,030,582.
Esco Corporation: *See—*
Barber, William R., Jr., 4,030,253.
Eskeli, Michael. Rotor with jet nozzles. 4,030,856, Cl. 415-80.000.
Espino, Ramon L.; and Pletzke, Thomas S., to Chem Systems Inc.

Methanol production in a paraffinic medium. 4,031,123, Cl. 260-449.500.

Esser-Werke GmbH vorm. Westmontan-Werke: *See—*
Siller, Vinzenz, 4,030,711.

Establissements Valois S.A.: *See—*
Le Guillou, Felix Francois, 4,030,667.

Esteve-Subirana, Antonio, to Laboratorios del Dr. Esteve S.A. 2,5-Dihydroxy benzene sulfonic acid mono- and diesters. 4,031,240, Cl. 424-308.000.

Etablissement Ani, chez Me Beck, avocat: *See—*
Paul, Roger, 4,030,976.

Etat Francais: *See—*
Cluzel, Philippe; Quivy, Michel; and Tocquet, Bernard, 4,031,418.
Lefaudeux, Francois L. M.; and Quivy, Michel Georges, 4,031,502.

Etes, Elmer G. Plural coin responsive mechanism for a dispensing machine. 4,030,586, Cl. 194-59.000.

Etheridge, Jay D., to Sun Oil Company of Pennsylvania. Automatic control system for vacuum loop sample injection system. 4,030,369, Cl. 73-422.0GC.

Ethyl Corporation: *See—*
Nelson, Gunner E., 4,031,143.

Eutectic Corporation: *See—*
Patel, Mahesh S., 4,031,278.

Euverard, Maynard R.; and Heide, Henry A., to Velten & Pulver, Inc. Apparatus and method for loading containers. 4,030,620, Cl. 214-6.00P.

Evans, David Arthur, to Strachan & Henshaw Limited. Rail wheel grippers. 4,030,574, Cl. 188-62.000.

Everman, Don D., to Lawrence Peska Associates, Inc. Apparatus for forming a bar of soap from leftover pieces. 4,030,867, Cl. 425-144.000.

Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., to International Flavors & Fragrances Inc. Foodstuff flavor compositions comprising 3-furyl alkyl sulfides and processes. 4,031,256, Cl. 426-535.000.

Evnina, Sarra Borisovna: *See—*
Shults, Mikhail Mikhailovich; Parfenov, Anatoly Ivanovich; Shnypikov, Alexandr Dmitrievich; Krunchak, Vladimir Georgievich; Evnina, Sarra Borisovna; Dolidze, Vladimir Alexandrovich; and Tarasova, Valentina Mikhailovna, 4,030,935.

Ex-Cell-O Corporation: *See—*
Reuschel, Donald L.; and Hendry, James W., 4,030,299.

Exxon Research and Engineering Company: *See—*
Geissler, Paul R.; and Healy, Frank J., 4,031,156.
Healy, Frank J.; and Geissler, Paul R., 4,031,151.
Healy, Frank J.; and Geissler, Paul R., 4,031,155.
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 4,031,300.

F. L. Smidth & Co.: *See—*
Horning, Bent, 4,030,528.

Faber, Ulbe, to Burroughs Corporation. Communications network for general purpose data communications in a heterogeneous environment. 4,031,512, Cl. 340-147.00R.

Fabri-Tek Incorporated: *See—*
Fuerst, Charles Floyd, 4,030,792.

Fabrin, Knud Christian Claus: *See—*
Lund, Svend Aage; Northeved, Allan; Solfjeld, Poul; and Fabrin, Knud Christian Claus, 4,030,343.
Northeved, Allan; Fabrin, Knud Christian Claus; and Solfjeld, Poul, 4,030,344.

Facet Enterprises, Inc.: *See—*
Giometti, Paul F., 4,030,581.
Miller, Donald L., 4,030,583.

Fadl, Mohamed F. A.; and Olasz, Joseph S., to Federal Products Corporation. Bore gage. 4,030,202, Cl. 33-178.00E.

Fagan, Joseph P., to Du Pont de Nemours, E. I., and Company. Polytetrafluoroethylene felt. 4,031,283, Cl. 428-280.000.

Fagersta AB: *See—*
Tiberg, Lars, 4,030,532.

Fahrbach, Gerhard: *See—*
Bronstert, Klaus; Fahrbach, Gerhard; Krahe, Eduard; Ladenberger, Volker; Kastning, Ernst-Guenther; Mittnacht, Hans; Willersinn, Herbert; and Trieschmann, Hans-Georg, 4,031,166.

Fairbairn, Thomas E., to Sirius Corporation. Process for spraying metallic patterns on a substrate. 4,031,268, Cl. 427-12.000.

Fairchild Camera and Instrument Corporation: *See—*
Luce, Robert L.; Perry, Joseph P.; and Sansburry, James D., 4,030,952.

Fallows, Jack: *See—*
Reinert, Gerhard; Fallows, Jack; and Dussy, Paul, 4,031,273.

Fangmeier, Ralf: *See—*
Koch, Rolf Eckart; and Fangmeier, Ralf, 4,030,332.

Fansteel Inc.: *See—*
Keifert, Hibbard G.; and Waters, Frank J., deceased, 4,030,848.
Keifert, Hibbard G.; and Waters, Frank J., deceased, 4,030,849.

Farquhar, Melville T., to Reynolds Metals Company. Carton and blank for making same. 4,030,661, Cl. 229-52.00B.

Farrell, Francis: *See—*
Reid, Joanne; de la Teja, Elpidio Leoncio; and Farrell, Francis, 4,031,238.

Fauran, Claude P.; Bourgery, Guy R.; Raynaud, Guy M.; and Dorme, Nicole A. M., to Delalande S.A. Furo (2,3d) pyrimidines. 4,031,089, Cl. 260-247.5DP.

Federal Products Corporation: *See—*
Fadl, Mohamed F. A.; and Olasz, Joseph S., 4,030,202.

Feecon Corporation: *See—*
Gagliardo, John P., 4,030,666.

Feiten, Karl-Josef: *See—*
Straeten, Franz-Josef; Pelzer, Rudolf; Feiten, Karl-Josef; and Stevens, Wilhelm-Josef, 4,030,961.

Feldman, Jacob Richard: *See—*
Lugay, Joaquin Castro; and Feldman, Jacob Richard, 4,031,259.

Felix, Pierre; Gamot, Philippe; Moiroud, Guy; and Veron, Serge, to Thomson CSF. Camera device with resistive target. 4,031,394, Cl. 250-333.000.

Felix Stiegler Maschinenfabrik: *See—*
Schulze, Ehrhart, 4,030,652.

Fellows, Stanley, to M.A. Buckley (Engraving) Limited. Flexographic printing roll having fluid pressure grooving for dismounting. 4,030,415, Cl. 101-382.00R.

Ferrari, Luigi M.: *See—*
Lench, Jack; and Ferrari, Luigi M., 4,030,844.

Fessler, Jon Leroy, to Tektronix, Inc. Photometer mode indicator. 4,030,838, Cl. 356-219.000.

Fiat-Allis Construction Machinery, Inc.: *See—*
Luebkemann, Leroy, 4,030,178.

Fiat Societa per Azioni: *See—*
Gemmellaro, Carmelo; Maggioni, Virginio; and Moretti, Renzo, 4,030,759.

Fick, Henry A. Retention device for filleting fish. 4,030,164, Cl. 17-70.000.

Fidrych, Alfred Walter, to Harvey Hubbell, Incorporated. Cord grips. 4,030,741, Cl. 285-161.000.

Findley, Gerald I., to International Business Machines Corporation. Printer. 4,031,519, Cl. 364-900.000.

Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C.: *See—*
Possati, Mario; and Danielli, Franco, 4,030,201.

Finnimore, Norman Alan. Sheet cutting machine. 4,030,387, Cl. 83-49.000.

Fiorelli, Maria: *See—*
Lambertz, Martin R.; and Fiorelli, Maria, 4,030,160.

Firester, Arthur Herbert; and Gorog, Istvan, to RCA Corporation. Defect detection system. 4,030,835, Cl. 356-111.000.

Firestone Tire & Rubber Company, The: *See—*
Johnson, Melvin Kermit; and Pilarski, Regis Victor, 4,030,648.
Pilarski, Regis Victor; and Rumpf, Robert John, 4,031,344.

First, David J. Voltage to frequency converter. 4,031,532, Cl. 340-347.0NT.

Fischer, Adolf, deceased (by Fischer, Caecilia Emma, heiress-at-law), to BASF Aktiengesellschaft. Herbicidal compositions. 4,030,909, Cl. 71-91.000.

Fischer, Caecilia Emma, heiress-at-law: *See—*
Fischer, Adolf, deceased, 4,030,909.

Fischer, Gunther: *See—*
Gahler, Siegfried; Junge, Karl-Wilhelm; Fischer, Gunther; Scheithauer, Steffen; and Viola, Horst, 4,030,928.

Fischer & Porter Co.: *See—*
Herzl, Peter J., 4,030,355.
Kazahaya, Masahiro; and Bonner, John J., 4,030,366.

Fischer, William A.: *See—*
Hammel, Ronald O.; Kuykendall, Charles N.; and Fischer, William A., 4,031,450.

Fish, Leonard A.; and Moore, Robert L. Portable weighing scale. 4,030,559, Cl. 177-159.000.

Fisher, Glen W., to Technovators, Inc. System for controlling segregation within a bin during material withdrawal. 4,030,633, Cl. 222-1.000.

Fisher, Lloyd R., to Page, Joe W., Jr. Combination hand tool. 4,030,150, Cl. 7-15.000.

Fishwick, Brian Ribbons: *See—*
Boyd, Violet; Fishwick, Brian Ribbons; and Glover, Brian, 4,030,881.

Fisons Limited: *See—*
Bennett, Frank William, 4,031,174.

Fitzer, George E.: *See—*
United States of America, National Aeronautics and Space Administration; and Fitzer, George E., 4,030,348.

Fitzwater Engineering Company: *See—*
Fitzwater, John Herman, 4,030,962.

Fitzwater, John Herman, to Fitzwater Engineering Company. Heat transfer press. 4,030,962, Cl. 156-583.000.

Flanders Filters, Inc.: *See—*
Wilcox, David E., 4,030,518.

Fleming, Robert Willerton, to Parke, Davis & Company. Cis-2, 6-dimethyl-α,α-diphenyl-1-piperidinebutanol compounds. 4,031,101, Cl. 260-293.840.

Fleshman, John F. Night fishing rig. 4,030,691, Cl. 248-225.300.

Fletcher Sutcliffe Wild Limited: *See—*
Dudley, Philip; Bower, Lewis Robert; and Wake, Malcolm, 4,030,308.

Fletcher-Terry Company, The: *See—*
Insolio, Thomas A., 4,030,195.

Florica, Mihai: *See—*
Stanasila, Virgil Corneliu; Florica, Mihai; and Lungu, Onut Antoniu, 4,030,879.

Flototto, Reinhard-Heinrich. Furniture frame joint. 4,030,846, Cl. 403-231.000.

Flow Pharmaceuticals, Inc.: *See—*
Krezanoski, Joseph Zenon, 4,031,209.

FMC Corporation: *See—*
Berkowitz, Sidney; and D'Angelo, John, 4,031,091.
Goldstein, David; Kibbel, William Henry, Jr.; and Hollenbach, Roger C., 4,031,090.
Shepard, E. Dwayne; and Scherbel, Gordon H., 4,030,709.
Thomas, James L., 4,031,061.

Foerster, Ronald A.: *See—*
Jameel, Khaja M.; Mueller, Von W.; and Foerster, Ronald A., 4,031,460.

Foley, Jerrold Stokes: *See—*
Holloran, Thomas Patrick; Braden, Arthur Buell; Foley, Jerrold Stokes; Maynard, James Lucian; Klosky, John Patrick; Dissauer, Gerald Anthony; Adams, Terrence Miller; and Lorenz, Allan Alfred, 4,031,518.

Folk, Craig L.; and Kotter, James I., to United States of America, Agriculture. Fiber blending, subdividing, and distributing system. 4,030,280, Cl. 57-58.950.

Foller, Werner, to Gestra-KSB Vertriebsgesellschaft mbH & Co. Bremen. Float controllable valve. 4,030,516, Cl. 137-192.000.

Fonseca, Anthony G., to Continental Oil Company. Hydrometallurgical processing of metal sulfides. 4,030,917, Cl. 75-103.000.

Ford Motor Company: *See—*
Kantz, Don B.; and Lezotte, Tim F., 4,030,297.

Formeister, Richard B., to Sperry Rand Corporation. Limiter circuit for servosystems. 4,031,483, Cl. 331-17.000.

Formica Corporation: *See—*
Keeling, Ronald James, 4,031,281.

Forsyth, Bruce Adam; Pryor, David Ernest; McGarry, Errol James; and Harney, Donald William Gerald, to ICI Australia Limited. Compositions containing certain 2,4-halo-6-nitrophenols or derivatives thereof and methods for using same to eradicate internal parasites in warm-blooded animals. 4,031,249, Cl. 424-347.000.

Forterre, Gerard: *See—*
Bernard, Nicolle; and Forterre, Gerard, 4,031,489.

Fortune, Jeffrey L. Shower water temperature measuring instrument. 4,030,360, Cl. 73-349.000.

Fortune, Jeffrey L. Floating bath water temperature measuring instrument. 4,030,361, Cl. 73-353.000.

Foster, Edwin E. Pedal actuated bicycle brake with coordinating supporting stand. 4,030,774, Cl. 280-261.000.

Fouratt, George Thomas, to International Telephone and Telegraph Corporation. Circuit to indicate the simultaneous off-hook condition of at least two of a plurality of telephone subsets on the same telephone line. 4,031,333, Cl. 179-81.00R.

Fox Valley Tool & Die, Inc.: *See—*
Heiting, Richard H., 4,030,390.

Foxboro Company, The: *See—*
Shinskey, Francis G., 4,030,986.

Fradin, David W.: *See—*
Freiberg, Robert J.; Fradin, David W.; Chenausky, Peter P.; and Biancardi, Frank R., 4,031,484.

Francis, Jane S. Portable sewing aligning table system. 4,030,200, Cl. 33-76.00R.

Frank, Freidhelm: *See—*
Jacob, Friedrich; Voigt, Gerhard; and Frank, Freidhelm, 4,030,735.

Franken, Adrianus Jacobus Jozef: *See—*
Khoe, Giok Djan; Kuyt, Gerard; and Franken, Adrianus Jacobus Jozef, 4,030,811.

Franz, Arnold; Huthwelker, Dirk; and Jacob, Lothar, to Dynamit Nobel Aktiengesellschaft. Printed circuits with arc-retardance. 4,031,313, Cl. 174-68.500.

Franz, William F.: *See—*
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,030,981.

Frauenhoff, Richard E.: *See—*
Moring, Rodger L.; and Frauenhoff, Richard E., 4,030,575.

Fraze, Ermal C.: *See—*
Brown, Omar L., 4,030,631.

Fredrickson, Bengt; and Stenkvist, Sven-Einar, to ASEA Aktiebolag. Direct current arc furnace hearth connection installation. 4,031,308, Cl. 13-9.00R.

Freeman, Charles F.: *See—*
Bosserman, David A.; and Freeman, Charles F., 4,031,552.

Freeman, John D.; Robinson, Ralph C.; and Swonger, Kenneth D., to General Time Corporation. Display apparatus for automotive vehicles. 4,031,363, Cl. 235-150.200.

Freiberg, Robert J.; Fradin, David W.; Chenausky, Peter P.; and Biancardi, Frank R., to United Technologies Corporation. Portable chemical laser with gas recirculation. 4,031,484, Cl. 331-94.50G.

Freitag, Dieter: *See—*
Idel, Karsten-Josef; Saleck, Wilhelm; Wolff, Erich; and Freitag, Dieter, 4,030,929.

Freitag, Herbert, to Stabilus GmbH. Pneumatic suspension element. 4,030,716, Cl. 267-64.00R.

French, James Clark: *See—*
Nicolaides, Ernest D.; Tinney, Francis John; and French, James Clark, 4,031,069.

Frey, Jurgen; Weber, Andreas; and Triffterer, Adolf, to Daimler-Benz Aktiengesellschaft. Internal combustion engine with return line for exhaust gases. 4,030,463, Cl. 123-119.00A.

Freyberger, Laurin Clemens: *See—*
Schat, Hermannus; and Freyberger, Laurin Clemens, 4,031,411.

Fried, John H.: *See—*
Beard, Colin C.; Edwards, John A.; and Fried, John H., 4,031,234.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Hoffmeister, Bernhard; and Dose, Gerhard, 4,030,973.

Fromantin, Andre Paul Edouard. Machine for preforming shoe uppers. 4,030,154, Cl. 12-54.100.

Frommer, Werner: *See—*
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,207.
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Karl Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,208.

Fuchs, Hugo: *See—*
Rapp, Guenther; Fuchs, Hugo; and Thomas, Erwin, 4,031,139.

Fuerst, Charles Floyd, to Fabri-Tek Incorporated. Tuning fork connector. 4,030,792, Cl. 339-17.0LC.

Fuji Photo Film Co., Ltd.: *See—*
Honjo, Satoru; and Matsumoto, Seiji, 4,030,922.
Kondo, Toshihiro, 4,030,567.
Noguchi, Yasuhiro; Ukai, Toshinao; Sashihara, Kenji; and Masuda, Takao, 4,030,931.
Sashihara, Kenji; Masuda, Takao; Noguchi, Yasuhiro; Sekikawa, Nobuyoshi; and Shishido, Tadao, 4,030,930.
Suzuki, Osamu; Akashi, Goro; Kasuga, Akira; and Sega, Kenji, 4,030,685.
Takahashi, Isoji, 4,031,269.
Tani, Tadaaki, 4,030,927.

Fuji Photo Optical Co., Ltd.: *See—*
Nishizawa, Tetsuo, 4,030,820.

Fuji Sangyo Kabushiki Kaisha: *See—*
Ishizawa, Toushichi, 4,030,951.

Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Aishita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, to Ono Pharmaceutical Co., Ltd. Method for purification of physiologically active substance using enzyme-enzyme inhibitor system. 4,030,977, Cl. 195-66.00R.

Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, to Sumitomo Chemical Company, Limited. Insecticidal substituted acetate compounds. 4,031,235, Cl. 424-274.000.

Fujimoto, Masanori: *See—*
Shirayama, Kenzo; Kita, Shinichiro; and Fujimoto, Masanori, 4,031,062.

Fujisou, Tokuo: *See—*
Sugiura, Kensuke; Kagaya, Mineo; Fujisou, Tokuo; Aoki, Hiroyuki; Takehara, Takeichiro; and Kurata, Shigenori, 4,031,020.

Fujita, Choichi: *See—*
Kato, Yoshiro; and Fujita, Choichi, 4,031,548.

Fujita, Shigeru; Murayama, Koichi; and Kaneda, Toyohito, to Kabushiki Kaisha Japan Metal Finishing Company. Zinc plating method. 4,030,987, Cl. 204-55.00R.

Fujiwara, Hideo; Ichinose, Yukio; Taniguchi, Satoshi; Kobayashi, Tsutomu; Ichino, Kazuo; Itoh, Michiyasu; Uesaka, Yasutaro; Inose, Fumiyuki; and Ueno, Sadayasu, to Hitachi, Ltd. Variable inductor. 4,031,496, Cl. 336-135.000.

Fukui, Kiyoshige; Tamamura, Akira; and Nishimoto, Minoru, to Rank Xerox Ltd. Paper tray for copying machines. 4,030,725, Cl. 271-164.000.

Fukutome, Shuji. Device for capturing animals. 4,030,231, Cl. 43-35.000.

Fullenwider, Malcolm A., to Fullenwider, Malcolm A.; and Ament, Richard L., II. Hydrogen-oxidizing catalyst, and fuel cell electrode using same. 4,031,291, Cl. 429-40.000.

Funakoshi, Sozo: *See—*
Nagata, Toshio; Kawasaki, Kunijiro; Takahama, Ryuichiro; Miyatani, Yoshifusa; and Funakoshi, Sozo, 4,030,441.

Furane Plastics, Inc.: *See—*
Hirosawa, Frank N.; and Lee, Ming H., 4,031,049.

Furukawa Battery Co., Ltd., The: *See—*
Sano, Ichiro, 4,031,294.

Furukawa, Yoshitaka: *See—*
Horikoshi, Yoshiji; and Furukawa, Yoshitaka, 4,030,949.

Gabbert, James D.: *See—*
Hedrick, Ross Melvin; and Gabbert, James D., 4,031,164.

Gabriele, Joseph Michael: *See—*
Gabriele, William Joseph; and Gabriele, Joseph Michael, 4,030,719.

Gabriele, William Joseph; and Gabriele, Joseph Michael, to Contour Fabricators, Inc. Child immobilizing device for X-rays. 4,030,719, Cl. 269-328.000.

Gaetani, Quintino: *See—*
Papantoniou, Christos; and Gaetani, Quintino, 4,030,512.

Gagliardo, John P., to Feecon Corporation. Fire fighting nozzle. 4,030,666, Cl. 239-526.000.

Gahler, Siegfried; Junge, Karl-Wilhelm; Fischer, Gunther; Scheithauer, Steffen; and Viola, Horst, to VEB Filmfabrik Wolfen-Fotochemisches Kombinat. Process of sensitizing silver halide emulsion with a dithioester. 4,030,928, Cl. 96-107.000.

Galabov, Peter Konstantinov: *See—*
Kochemidov, Atanas Dimitrov; Makedonski, Boris Georgiev; Dumanov, Ivan Minkov; Payakov, Stefan Georgiev; Galabov, Peter Konstantinov; and Atanassov, Haralampi Aangelov, 4,030,249.

Galashina, Malvina Leontievna: *See—*
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich;

Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.

Gallagher, H. Dan. Multiple pitch animal call. 4,030,241, Cl. 46-180.000.

Gamba, Piero: *See—*
Longa, Pier Luigi; and Gamba, Piero, 4,031,452.

Gamburtzev, Sergei Sergeev: *See—*
Budevski, Evgueni Bogdanov; Iliev, Iliya Dimitrov; Kaisheva, Anastasiya Rostislavova; Gamburtzev, Sergei Sergeev; and Vakanova, Elena Borisova, 4,031,033.

Gamot, Philippe: *See—*
Felix, Pierre; Gamot, Philippe; Moiroud, Guy; and Veron, Serge, 4,031,394.

Garcia, Ricardo L., to Grayhill, Inc. Miniature electrical switch. 4,031,345, Cl. 200-67.0AA.

Gardner, Jeffrey M., to Container Corporation of America. Partition arrangement. 4,030,659, Cl. 229-42.000.

Gardner, Jeffrey M.: *See—*
Rada, Joseph J.; and Gardner, Jeffrey M., 4,030,660.

Gardner, Joseph G.: *See—*
Adhikari, Manoj C.; and Gardner, Joseph G., 4,030,409.

Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., to ACF Industries, Incorporated. Rigid railway car truck. 4,030,424, Cl. 105-182.00R.

Garrett, David Aubrey, to Vactric Control Equipment Limited. Optical encoder. 4,031,441, Cl. 318-480.000.

Gasc, Jean-Claude: *See—*
Chazan, Jean-Bernard; and Gasc, Jean-Claude, 4,031,210.

Gates Rubber Company, The: *See—*
Hammel, Ronald O.; Kuykendall, Charles N.; and Fischer, William A., 4,031,450.
Stecklein, Alfred L., 4,030,276.

Gayo, Nenesio: *See—*
Aparicio, Luis; Gayo, Nenesio; M° ; Martin, Jose Luis; and Ron, Armando, 4,031,243.

Geiger, Otto, to GeSig Energietechnik GmbH. Electric generator. 4,031,421, Cl. 310-112.000.

Geissler, Paul R.; and Healy, Frank J., to Exxon Research and Engineering Company. Separation and recovery of ethylbenzene by dual desorbent composition and temperature separation processes. 4,031,156, Cl. 260-674.0SA.

Geissler, Paul R.: *See—*
Healy, Frank J.; and Geissler, Paul R., 4,031,151.
Healy, Frank J.; and Geissler, Paul R., 4,031,155.

Geisslinger, Wolfgang; and Ungnadner, Peter, to AGFA-Gevaert, A.G. Motion picture sound camera. 4,030,818, Cl. 352-72.000.

Gelperina, Eleonora Grigorievna: *See—*
Khcheyan, Khachik Egorovich; Revenko, Olga Mikhailovna; Shatalova, Alla Nikolaevna; Gelperina, Eleonora Grigorievna; Agrinskaya, Lidia Ivanovna; and Muradian, Georgy Avanesovich, 4,031,128.

Gemmeke, Wilfried; Werner, Heinrich; Echterhoff, Heinz; and Raulf, Erich, to Verkaufsgesellschaft fur Teererzeugnisse (VfT). Process for preparing composition containing carbon and low sulfur, nitrogen and ash content. 4,031,189, Cl. 423-449.000.

Gemmellaro, Carmelo; Maggioni, Virginio; and Moretti, Renzo, to Fiat Societa per Azioni. Pneumatic anti-skid brake system having proportional pressure control means. 4,030,759, Cl. 303-119.000.

General Cable Corporation: *See—*
Jachimowicz, Ludwik, 4,031,310.

General Converters & Assemblers, Inc.: *See—*
Danowski, Edwin K., 4,030,760.

General Dynamics Corporation: *See—*
Briney, Douglas W., 4,030,807.
Schaefer, William H.; and Bender, Richard E., 4,031,181.

General Electric Company: *See—*
Armor, Anthony F.; Chari, Madabushi V. K.; Kudlacik, Henry W.; and Reece, Paul, 4,031,422.
Bessen, Irwin I., 4,031,274.
Bowers, David L., 4,030,510.
Colter, John Cecil; James, Dean B.; Keith, Walter Gill; and Akbari-Kenari, Reza, 4,031,029.
Dombrowski, Frank R.; and Larson, Raymond L., 4,030,184.
Grondahl, Clayton M.; and Gerhold, Bruce W., 4,030,875.
Johnson, Curtis A.; and Prochazka, Svante, 4,031,178.
Laughter, Clifford M., 4,031,382.
Lennon, David C.; and Wandler, Richard A., 4,030,802.
Matulevich, E. S., 4,031,509.
Michonski, Ronald E., 4,030,176.
Olashaw, William Francis, 4,031,433.
Peil, William, 4,031,416.
Sargisson, Donald Farley, 4,030,291.
Whetten, Nathan Rey; and Houston, John M., 4,031,396.

General Foods Corporation: *See—*
Berry, Martin F.; Reesman, Stanley H.; Smith, Marvin L.; and Middlesworth, Peter Van, 4,031,267.
Haas, Gerhard J.; and Berg, Jeffrey H., 4,031,258.
Haas, Gerhard Julius; Herman, Edwin Bernard; and Lugay, Joaquin Castro, 4,031,250.
Lugay, Joaquin Castro; and Feldman, Jacob Richard, 4,031,259.
Malizia, Peter Donato; and Mitchell, William Alexander, 4,031,255.
Mitchell, William A.; and Seidel, William C., 4,031,266.

General Monitors, Inc.: *See—*
Chang, Shih-Chia, 4,030,340.

General Motors Corporation: *See—*
King, Donald J.; Lura, Loren E.; and Maurushat, Ewalt, 4,030,784.

General Pattern Co., Inc.: *See—*
Reiland, Dennis J., 4,030,188.

General Public Utilities Corporation: *See—*
Harrison, David C., 4,031,528.

General Time Corporation: *See—*
Freeman, John D.; Robinson, Ralph C.; and Swonger, Kenneth D., 4,031,363.
Rigazio, Anthony W., 4,031,295.

General Tire & Rubber Company, The: *See—*
Hein, Richard D., 4,030,852.
Molbert, Robert A., 4,031,176.

Gentili, Bruno: *See—*
Guadagni, Dante G.; Horowitz, Robert M.; Gentili, Bruno; and Maier, Vincent P., 4,031,265.

Gentry, Elvin O. Crankshaft-forming apparatus and method. 4,030,172, Cl. 29-6.000.

Georgia Tech Research Institute: *See—*
Elston, Lewis W., 4,031,195.

Gerber, Evalyn: *See—*
Gerber, Warren E., 4,030,198.

Gerber, Warren E., to Gerber, Evalyn. Tooth enamel-stripping apparatus. 4,030,198, Cl. 32-58.000.

Gerhard Berger, Fabrik Elektrischer Messgerate: *See—*
Spiesberger, August; and Schaffer, Claus, 4,031,419.

Gerhold, Bruce W.: *See—*
Grondahl, Clayton M.; and Gerhold, Bruce W., 4,030,875.

Germana, Antonino: *See—*
Barba, Diego; Germana, Antonino; Liuzzo, Giuseppe; and Tagliaferri, Giovanni, 4,030,985.

Gervase, Nicholas J., to Lord Corporation. Isocyanatosilane adducts. 4,031,120, Cl. 260-448.80R.

GeSig Energietechnik GmbH: *See—*
Geiger, Otto, 4,031,421.

Gess, Larry C. Package and method and apparatus for producing same. 4,030,662, Cl. 229-87.00R.

Gestra-KSB Vertriebsgesellschaft mbH & Co. Bremen: *See—*
Foller, Werner, 4,030,516.

Ghosh, Asoke Kumar: *See—*
Crane, Robert Anthony; and Ghosh, Asoke Kumar, 4,031,485.

Ghougasian, John N. Variable size and angularly adjustable projection. 4,030,825, Cl. 355-71.000.

Giacobbe, Thomas J., to Dow Chemical Company, The. Process for making 2,6-difluoropyridine. 4,031,100, Cl. 260-290.0HL.

Giannone, Charles: *See—*
Hinden, Milton; and Giannone, Charles, 4,031,350.

Gibilaro, Frank. Link drive chain repair tool. 4,030,286, Cl. 59-7.000.

Gibson, Edwin D.; and Verhoeven, John D., to United States of America, Energy Research and Development Administration. Arc-melting preparation of single crystal LaB_6 cathodes. 4,030,963, Cl. 156-602.000.

Gics, Paul W., to Gics Pharmaceuticals, Inc. Separatory apparatus. 4,031,012, Cl. 210-321.00A.

Gics Pharmaceuticals, Inc.: *See—*
Gics, Paul W., 4,031,012.

Giles, Thomas Clyde; Kohout, Otto James; and Rinaldi, Gerald Michael, to GTE Automatic Electric Laboratories Incorporated. Circuit arrangement for producing high current pulses. 4,031,414, Cl. 307-270.000.

Gill, Walter: *See—*
Cram, Robert E.; Gill, Walter; and Loundagin, James A., 4,030,523.

Gillette Company, The: *See—*
Gross, Thomas A. O., 4,031,431.
Pentney, Harry, 4,030,598.

Gilmore, Bennett J. Board game with diagonal paths. 4,030,762, Cl. 273-134.0AD.

Ginkel, Frank. Opposed piston engine. 4,030,471, Cl. 123-197.00R.

Giometti, Paul F., to Facet Enterprises, Inc. Electromagnetic roller clutch. 4,030,581, Cl. 192-16.000.

Giraud, Pierre; Palais, Conrad; and Rapkin, Edward, to Intertechnique S.A. Method and devices for counting events, particularly radioactive disintegration events. 4,031,392, Cl. 250-328.000.

Giudicelli, Don Pierre Rene Lucien; and Najer, Henry, to Synthelabo. N-meta-trifluoromethylpiperazines. 4,031,094, Cl. 260-268.0PH.

Givaudan Corporation: *See—*
Naegeli, Peter, 4,031,132.

Glaze, Stanley George, to Lucas Industries Limited. Damping device for a vehicle suspension. 4,030,580, Cl. 188-299.000.

Gloeckler, Alfred, to Superba S.A. Domestic knitting machine. 4,030,319, Cl. 66-75.200.

Glorioso, Paul A., to TRW Inc. Stud welding control. 4,031,349, Cl. 219-98.000.

Gloucester Engineering Co. Inc.: *See—*
Schott, Charles M., Jr., 4,030,681.

Glover, Brian: *See—*
Boyd, Violet; Fishwick, Brian Ribbons; and Glover, Brian, 4,030,881.

Goel, Krishan N.; and Walker, Osman J., to Consolidated-Bathurst Limited. Disposal of paper pulp mill sludge. 4,030,968, Cl. 162-16.000.

Goldberg, Edwin Allen, to RCA Corporation. Non-integer frequency divider having controllable error. 4,031,476, Cl. 328-39.000.

Goldberg, Hannes: *See—*
Beilmann, Manfred; and Goldberg, Hannes, 4,030,333.
Golden M Enterprises, Inc.: *See—*
McDonald, David, 4,030,506.
Goldstein, David, to United States of America, Navy. Armor plate. 4,030,427, Cl. 109-82.000.
Goldstein, David; Kibbel, William Henry, Jr.; and Hollenbach, Roger C., to FMC Corporation. Stabilized isocyanurate. 4,031,090, Cl. 260-248.00C.
Goldwell GmbH: *See—*
Koyama, Masaya, 4,030,665.
Golovkina, Elena Yakovlevna: *See—*
Chachin, Viktor Nikolaevich; Zhuravsky, Alexandr Julyanovich; Zdor, Gennady Nikolaevich; Shaduya, Vladimir Leontievich; and Golovkina, Elena Yakovlevna, 4,030,329.
Goodwin, Eber Lyle, to Addressograph Multigraph Corporation. High operator efficiency duplicating system. 4,030,724, Cl. 271-64.000.
Goodyear Tire & Rubber Company, The: *See—*
Bhakuni, Roop S.; and Rye, Grover W., 4,031,288.
Curtiss, Walter W., Jr., 4,030,530.
Kahaner, Joel M., 4,030,653.
Smith, Edwin Studley, 4,031,297.
Gordon, Peter H., to Alkon Laboratories, Inc. Charging circuit with SCR's triggered by pedestal and cosine modified ramp unijunction circuit having means for current limiting by controlling pedestal level. 4,031,451, Cl. 320-23.000.
Gordon, Stanley H., to Acme Staple Company, Inc. Stapler. 4,030,656, Cl. 227-131.000.
Gordon, Vladimir Grigorievich: *See—*
Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tatarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,030,891.
Gorin, Everett; Jasulaitis, William A.; Theodore, Frank W.; and Wasson, George E., to Consolidation Coal Company. Process of making formcoke from non-caking or weakly caking coals. 4,030,982, Cl. 201-6.000.
Gorog, Istvan: *See—*
Firester, Arthur Herbert; and Gorog, Istvan, 4,030,835.
Goshima, Takeshi; and Mochizuki, Noritaka, to Canon Kabushiki Kaisha. Scanning optical system. 4,030,806, Cl. 350-7.000.
Goswami, Jagadish Chandra, to Stauffer Chemical Company. Foamable PVC resin formulation, process for foaming, and product thereof. 4,031,045, Cl. 260-2.50R.
Gottschlich, Rudolf; Rogalski, Werner; Bergmann, Rolf; Steinigeweg, Rosmarie; and Wahlig, Helmut, to Merck Patent Gesellschaft mit beschrankter Haftung. Novel penicillins and their preparation. 4,031,230, Cl. 424-271.000.
Gougeon, Thomas William: *See—*
Laughlin, Robert Gene; and Gougeon, Thomas William, 4,031,202.
Gough, Stanley T.; Tobias, Michael A.; and Napier, Roger P., to Mobil Oil Corporation. Carbamate insecticides from 5,8-dihydro-5,8-methano-1-naphthol and its derivatives. 4,031,237, Cl. 424-278.000.
Gowrinathan, Sankaran, to United States of America, Navy. Phase detector for optical figure sensing. 4,030,831, Cl. 356-109.000.
Grado, Joseph F. Electromagnetic pickup with magnetic gap displacement generator. 4,031,336, Cl. 179-100.41K.
Graham, John C., to Hooker Chemicals & Plastics Corporation. Process for the directed chlorination of alkylbenzenes. 4,031,142, Cl. 260-650.00R.
Graham, John C., to Hooker Chemicals & Plastics Corporation. Process for directed chlorination of alkylbenzenes. 4,031,147, Cl. 260-650.00R.
Granges Essem Aktiebolag: *See—*
Wallin, Jan-Olof, 4,030,682.
Grannis, Roland K., to Pacific Utilities Supply Co. Utility pole drill guide. 4,030,854, Cl. 408-115.00B.
Graupe, Daniel, to United States of America, Veterans Administration. Multi-function control system for an artificial upper-extremity prosthesis for above-elbow amputees. 4,030,141, Cl. 3-1.100.
Gray, Robert. Pallet racks. 4,030,612, Cl. 211-192.000.
Graybeal, Walter C. Manhole closure including a two-way pressure relief valve. 4,030,851, Cl. 404-25.000.
Grayhill, Inc.: *See—*
Garcia, Ricardo L., 4,031,345.
Grechinsky, Dmitry Alexeevich: *See—*
Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich, 4,030,339.
Green, William Geary: *See—*
Bouvier, David William; Green, William Geary; and Moore, Randolph Gaylon, 4,031,462.
Griffin, Thomas J., Jr., to Dow Chemical Company, The. Method of reducing friction loss. 4,031,014, Cl. 252-8.55R.
Griffith, Glen R.: *See—*
Deutsch, Ralph; and Griffith, Glen R., 4,031,377.
Griffiths, Clifford H.; and Keezer, Richard C., to Xerox Corporation. Method for the preparation of X-form metal phthalocyanine and X-form metal free compounds. 4,031,109, Cl. 260-314.500.
Grigat, Ernst: *See—*
Sundermann, Rudolf; Rottloff, Gunther; and Grigat, Ernst, 4,031,067.
Grigorenko, Anatoly Sergeevich; Moroz, Jury Antonovich; and Landyshev, Vladimir Vladislavovich. Hydraulic protection device for presses. 4,030,336, Cl. 72-432.000.
Grilli, Victor J.: *See—*
Conn, Thomas E.; and Grilli, Victor J., 4,030,663.
Grinberg, Jan: *See—*
Miller, Leroy J.; and Grinberg, Jan, 4,030,997.
Grinstead, Robert R.; and Nasutavicus, Wilmonte A., to Dow Chemical Company, The. Water insoluble chelate exchange resins having a crosslinked polymer matrix and pendant thereto a plurality of methyleneaminopyridine groups. 4,031,038, Cl. 260-2.20R.
Grondahl, Clayton M.; and Gerhold, Bruce W., to General Electric Company. Integrated ceramic-metal combustor. 4,030,875, Cl. 431-352.000.
Gross, Erwin; and Vowinkel, Hans, to Hoechst Aktiengesellschaft. Multi-element type radiator of plastic material. 4,030,541, Cl. 165-175.000.
Gross, Thomas A. O., to Gillette Company, The. Ground fault circuit interrupter. 4,031,431, Cl. 307-326.000.
Grot, Walther Gustav, to Du Pont de Nemours, E. I., and Company. Process for producing halogen and metal hydroxides with cation exchange membranes of improved permselectivity. 4,030,988, Cl. 204-98.000.
Grottola, Oresto P. Closed peg box on stringed instrument. 4,030,399, Cl. 84-304.000.
Groudan, Alan I.; Schroeder, George F.; and Treffinger, H. Lee, to Singer Company, The. Error correction system for random access memory. 4,031,374, Cl. 235-153.0AM.
Groupement Atomique Alsacienne Atlantique: *See—*
Martin, Jean, 4,031,351.
Groupement pour les Activities Atomiques et Advancees "GAAA" S.A.: *See—*
Carbonnel, Henri, 4,030,538.
Grous, Philip P.: *See—*
Mohrbacher, Richard J.; and Grous, Philip P., 4,031,079.
Groves, Malcolm Duane, to Combustion Engineering, Inc. Fluidly driven control rod. 4,030,972, Cl. 176-36.00R.
Gruev, Peter Vassilev: *See—*
Arolski, Angel Tomov; Usheva, Velichka Borissova; Gruev, Peter Vassilev; Richev, Georgi Trendafilov; and Doncheva, Zvetana Semkova, 4,031,264.
Grund, Peter; Schmidt, Jurgen; and Hesse, Jurgen, to Messer Griesheim GmbH. Device for removing burrs from workpieces. 4,030,247, Cl. 51-419.000.
Gruz, Boris Efimovich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.
GTE Automatic Electric Laboratories Incorporated: *See—*
Giles, Thomas Clyde; Kohout, Otto James; and Rinaldi, Gerald Michael, 4,031,414.
Jameel, Khaja M.; Mueller, Von W.; and Foerster, Ronald A., 4,031,460.
Pitroda, Satyan G., 4,031,328.
GTE New Ventures Corporation: *See—*
Marinkovich, Vincent A., 4,031,197.
GTE Sylvania Incorporated: *See—*
Williams, G. Norman; and Schultz, Thomas W., 4,030,790.
Guadagni, Dante G.; Horowitz, Robert M.; Gentili, Bruno; and Maier, Vincent P., to United States of America, Agriculture. Method of reducing bitterness in citrus juices. 4,031,265, Cl. 426-599.000.
Gubbels, Christoph. Garment clasp. 4,030,167, Cl. 24-210.000.
Guggi, Diether Josef; and Klein, Rolf, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Manipulator for movement of articles in a controlled environment chamber, especially a high vacuum chamber. 4,030,615, Cl. 214-1.0BB.
Gulf & Western Manufacturing Company (Hastings): *See—*
Miller, Stanley J.; and Heniser, Richard J., 4,030,432.
Gundersen, Marius, to Vefi A/S. Means on packing machine. 4,030,272, Cl. 53-376.000.
Gunnell, Thomas J., to Phillips Petroleum Company. Carbon black reactor with adjustable flame length. 4,030,889, Cl. 23-259.500.
Gunther, W. H. H.: *See—*
Chu, Joseph Y. C.; and Gunther, W. H. H., 4,030,991.
Chu, Joseph Y. C.; and Gunther, W. H. H., 4,030,992.
Chu, Joseph Y. C.; and Gunther, W. H. H., 4,030,993.
Gurski, Frank: *See—*
Citrin, Paul S.; and Gurski, Frank, 4,030,640.
Gushima, Hideki: *See—*
Hanagata, Takayoshi; Gushima, Hideki; and Seki, Mitsuaki, 4,030,588.
Gutman, Abraham: *See—*
Labie, Allan S.; Thornton, Charles; Lew, Irwin Paul; and Gutman, Abraham, 4,030,257.
Haas, Gerhard J.; and Berg, Jeffrey H., to General Foods Corporation. Inorganic salts of dipeptide sweeteners. 4,031,258, Cl. 426-548.000.
Haas, Gerhard Julius; Herman, Edwin Bernard; and Lugay, Joaquin Castro, to General Foods Corporation. Method for imparting red color to animal food. 4,031,250, Cl. 426-18.000.
Haba, Masanori: *See—*
Hayashi, Masahiro; Haba, Masanori; Watanabe, Misuzu; and Hirano, Shinji, 4,031,498.

Habermehl, Diethard: *See*—
Beck, Kurt Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, 4,030,983.
Hablutzel, Kurt; and Lamparter, Hansruedi, to Rieter Machine Works, Ltd. Method and apparatus for producing a continuous even strand of fibers. 4,030,635, Cl. 222-55.000.
Habrovec, Frantisek: *See*—
Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, 4,030,944.
Hackert, Raymond Leo, to Du Pont de Nemours, E. I., and Company. Process of pigmenting polyamides. 4,031,060, Cl. 260-37.00N.
Hafele, Joseph C.: *See*—
Belke, William H.; and Hafele, Joseph C., 4,030,816.
Hafeli, Robert J., to Von Roll AG. Method of hygienic disposal of chlorine-containing plastic material. 4,031,192, Cl. 423-488.000.
Hager, Arnulf: *See*—
Volz, Horst; Straubel, Reinhard; and Hager, Arnulf, 4,031,525.
Hagiwara, Hisami: *See*—
Nakamura, Tadashi; Hagiwara, Hisami; and Kokubu, Yoshikazu, 4,031,000.
Hahm, Heinz Gunter; and Pocci, Nedo Igor, to ITT Industries, Incorporated. Method of manufacturing a brake pad assembly for a spot-type disc brake. 4,030,185, Cl. 29-413.000.
Hahn, Frank J.; and Santer, James O., to Monsanto Company. Liquid aminoplast polyfunctional resin compositions. 4,031,057, Cl. 260-32.60R.
Hale, Raymond P.: *See*—
Miller, Leonard G.; and Hale, Raymond P., 4,030,869.
Hall, David A.: *See*—
Bach, Nicholas J.; Hall, David A.; and Kornfeld, Edmund C., 4,031,097.
Hall, Phil H.; and Irwin, John W., to International Business Machines Corporation. Multimode programmable machines. 4,031,521, Cl. 364-200.000.
Hall, Wilbur S.; and Steinbrecher, Lester, to Amchem Products, Inc. Rinsing coated metallic surfaces. 4,030,945, Cl. 148-6.200.
Halleck, Michael E., to Electromedics, Inc. Electronic thermometer. 4,030,363, Cl. 73-362.0AR.
Hallmark Cards, Incorporated: *See*—
Meisner, Merlin M.; Matulis, Raymond M.; and Mackey, James R., 4,030,959.
Halperin, Levi Y.: *See*—
Zioni, Dov; and Halperin, Levi Y., 4,031,435.
Hamamura, Takayuki: *See*—
Nagata, Yasunori; Itoh, Hirotaka; Yazaki, Susumu; Hamamura, Takayuki; and Yoshiya, Shigeo, 4,030,884.
Hamel GmbH Zwirnmaschinen: *See*—
Eckholt, Heinrich, 4,030,683.
Hammel, Ronald O.; Kuykendall, Charles N.; and Fischer, William A., to Gates Rubber Company, The. Two step solid state battery charger. 4,031,450, Cl. 320-23.000.
Hammond, David A.; and Swinehart, Carl F., to Harshaw Chemical Company, The. Crystal growth procedure. 4,030,965, Cl. 156-616.00R.
Hammonds, James C.: *See*—
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 4,030,424.
Hanagata, Takayoshi; Gushima, Hideki; and Seki, Mitsuaki, to Canon Kabushiki Kaisha. Printer. 4,030,588, Cl. 197-1.00R.
Hanauer, Burton C.; and Patton, Charles Richard, to Hanauer Machine Works Incorporated. Medical equipment device for controlling dispositions of intravenous bottles. 4,030,690, Cl. 248-311.300.
Hanauer Machine Works Incorporated: *See*—
Hanauer, Burton C.; and Patton, Charles Richard, 4,030,690.
Hanlon, Richard J.; Damon, Neil F.; and Yeo, Herbert G., to Augat, Inc. Electronic programing jumper pins and dual-in-line assembly thereof. 4,030,793, Cl. 339-19.000.
Hanna, Kenneth W.: *See*—
Wojdyla, Gary A.; and Hanna, Kenneth W., 4,030,677.
Hansen, John H. Releasable gripper assembly for a jacking mechanism. 4,030,698, Cl. 254-106.000.
Hanson, Alden B.; Hanson, Chris A.; and Bertetto, Donald W., to Hanson Industries Inc. Adjustable flexure means for ski boot. 4,030,214, Cl. 36-105.000.
Hanson, Chris A.: *See*—
Hanson, Alden B.; Hanson, Chris A.; and Bertetto, Donald W., 4,030,214.
Hanson Industries Inc.: *See*—
Hanson, Alden B.; Hanson, Chris A.; and Bertetto, Donald W., 4,030,214.
Hapke, Donald William, to Boeing Company, The. Articulated nozzle for upper surface blown aircraft. 4,030,687, Cl. 244-12.500.
Haraguchi, Yoshimasa: *See*—
Umeda, Tomoyoshi; and Haraguchi, Yoshimasa, 4,031,554.
Harashima, Ikuo, to Sankyo Electric Company, Limited. Food vending machine with cooking apparatus. 4,030,632, Cl. 221-150.00A.
Hardebeck, Klaus: *See*—
Kuhn, Rolf; Hardebeck, Klaus; and Heinemann, Helmut, 4,031,213.
Hardy Company, The: *See*—
Wheeler, Philip T., 4,030,182.
Hari, Stefan: *See*—
Mory, Rudolf; and Hari, Stefan, 4,031,073.
Harney, Donald William Gerald: *See*—
Forsyth, Bruce Adam; Pryor, David Ernest; McGarry, Errol James; and Harney, Donald William Gerald, 4,031,249.
Harnish, James R., to Borg-Warner Corporation. Reverse cycle heat pump. 4,030,315, Cl. 62-324.000.
Harp, Fredrick Eugene. Triple corner boring bar. 4,030,843, Cl. 408-197.000.
Harris, John Ferguson, Jr.: *See*—
Sharkey, William Henry; and Harris, John Ferguson, Jr., 4,031,168.
Harrison, David C., to General Public Utilities Corporation. Transmitting over power lines. 4,031,528, Cl. 340-310.00R.
Harshaw Chemical Company, The: *See*—
Hammond, David A.; and Swinehart, Carl F., 4,030,965.
Harstad, Kenneth G.: *See*—
Russell, Gary R.; Chen, Che Jen; and Harstad, Kenneth G., 4,031,389.
Hartman, Arlin Philip, to Universal Bleacher Company. Folding handrail system for telescoping seating systems. 4,030,255, Cl. 52-9.000.
Hartung, Robert L., to Howell Instruments, Inc. Low cycle fatigue damage counter. 4,031,366, Cl. 235-151.300.
Harvey Hubbell, Incorporated: *See*—
Fidrych, Alfred Walter, 4,030,741.
Hasegawa, Hajime: *See*—
Koiwa, Seki; and Hasegawa, Hajime, 4,030,196.
Hasegawa, Shigeo: *See*—
Mizumoto, Yoshiaki; and Hasegawa, Shigeo, 4,031,039.
Hashimoto, Michiyoshi; and Shako, Hisahumi, to Honda Giken Kogyo Kabushiki Kaisha. Safety kickstarter for motorcycles. 4,030,561, Cl. 180-33.00R.
Haskell, Donald M., to Phillips Petroleum Company. Separation of styrene from xylenes. 4,031,153, Cl. 260-669.00A.
Hasty, James H., to Kendall Company, The. Intermittent compression device. 4,030,488, Cl. 128-24.00R.
Hata, Yoshitaka, to Nissan Motor Co., Ltd. Multi-cylinder internal combustion engine. 4,030,293, Cl. 60-285.000.
Hatsukano, Yoshikazu: *See*—
Shimada, Shunji; Hatsukano, Yoshikazu; and Yamashiro, Osamu, 4,031,456.
Hattori, Shuzo: *See*—
Tokudome, Katsumi; and Hattori, Shuzo, 4,031,428.
Hauni-Werke Korber & Co., KG: *See*—
Wahle, Gunter, 4,030,511.
Havens, Richard Calvin, to Motorola, Inc. Medium Q high power dual cavity oscillator. 4,031,486, Cl. 331-96.000.
Haverbeck, Gunther: *See*—
Kleinschmit, Einhard; Tattermusch, Peter; and Haverbeck, Gunther, 4,030,714.
Haviv, Fortuna; Patchornik, Abraham; and Altman, Janina, to Yeda Research and Development Co., Ltd. Cephalosporin antibiotics. 4,031,083, Cl. 260-243.00C.
Hawkins, Charles T., to PPG Industries, Inc. Grooving glass batch. 4,030,905, Cl. 65-135.000.
Hawryluk, Peter, to Raymond Lee Organization, Inc., The, a part interest. Vapor carburetor. 4,030,457, Cl. 123-34.00A.
Hayashi, Masahiro; Haba, Masanori; Watanabe, Misuzu; and Hirano, Shinji, to Kabushiki Kaisha Meidensha. Non-linear voltage-dependent resistor. 4,031,498, Cl. 338-21.000.
Hayashi, Yoshiaki: *See*—
Suzuki, Kazuo; Hayashi, Yoshiaki; and Nagamine, Seiichi, 4,031,287.
Hayashida, Yoshihiro, to Tokico Ltd. Dual system hydraulic braking apparatus for vehicle. 4,030,758, Cl. 303-84.00A.
Healy, Frank J.; and Geissler, Paul R., to Exxon Research and Engineering Company. Separation of hydrocarbons. 4,031,151, Cl. 260-666.00A.
Healy, Frank J.; and Geissler, Paul R., to Exxon Research and Engineering Company. Dual desorbent composition and temperature separation processes. 4,031,155, Cl. 260-674.0SA.
Healy, Frank J.: *See*—
Geissler, Paul R.; and Healy, Frank J., 4,031,156.
Heaman, James Patrick; and Michaud, James Anthony, to Bendix Corporation, The. Interpolation and control apparatus and method for a numerical control system. 4,031,369, Cl. 235-151.110.
Heaps, Harry D., to Connelly Containers, Inc. Collapsible bulk shipping container. 4,030,600, Cl. 206-386.000.
Heberlein Hispano S.A.: *See*—
Schopper, Alf; and Linder, Jean, 4,030,281.
Hedrick, Ross Melvin; and Gabbert, James D., to Monsanto Company. Lactam-polyol-polyacyl lactam terpolymers. 4,031,164, Cl. 260-857.0PG.
Heeren, Richard H., to Teletype Corporation. Read-only memories, and readout circuits therefor. 4,031,524, Cl. 340-173.00R.
Heide, Henry A.: *See*—
Euverard, Maynard R.; and Heide, Henry A., 4,030,620.
Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Jeschke, Willi, 4,030,727.
Heider, Joachim: *See*—
Kutter, Eberhard; Austel, Volkhard; Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; Lillie, Christian; and Kadatz, Rudolf, 4,031,219.
Heiland, Wolfgang K.: *See*—
Sullivan, John F.; Konstance, Richard P.; and Heiland, Wolfgang K., 4,031,252.
Heilman, Marlin S.; Langer, Alois A.; Mirowski, Mieczyslaw; Mower, Morton M.; and Reilly, David M., to Mirowski, Mieczyslaw. Implant-

able electrodes for accomplishing ventricular defibrillation and pacing and method of electrode implantation and utilization. 4,030,509, Cl. 128-419.00D.

Heim Universal Corporation: *See—*
McCloskey, Albert R., 4,030,783.

Heimke, Wolfram, to Union Industrielle et D'Entreprise. Handling device for shifting heavy loads along a sliding track. 4,030,699, Cl. 254-108.000.

Heimke, Wolfram, to Union Industrielle et d'Entreprise. Method and apparatus for fluidifying powderous substances. 4,030,755, Cl. 302-29.000.

Hein, Richard D., to General Tire & Rubber Company, The. Compression seal for variably spaced joints. 4,030,852, Cl. 404-66.000.

Heinemann, Helmut: *See—*
Kuhn, Rolf; Hardebeck, Klaus; and Heinemann, Helmut, 4,031,213.

Heinold, Lloyd K., to Caterpillar Tractor Co. High visibility mast for lift trucks. 4,030,568, Cl. 187-9.00E.

Heinroth, Karl-August; Dietrich, Theo; Bach, Hans; and Jurischka, Hans-Dieter, to Bayer Aktiengesellschaft. Highly elastic crimp yarn. 4,030,278, Cl. 57-34.0HS.

Heinsohn, Howard H., Jr.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., 4,031,256.

Heiser, Joachim, to Robert Bosch G.m.b.H. Hydraulic control valve arrangement. 4,030,522, Cl. 137-596.130.

Heiskell, Robert F.: *See—*
Zerlaut, Gene A.; and Heiskell, Robert F., 4,031,385.

Heiss, Lorenz, to Hoechst Aktiengesellschaft. Process for the preparation of trans, trans-muconic acid. 4,031,136, Cl. 260-537.00N.

Heiting, Richard H., to Fox Valley Tool & Die, Inc. Apparatus for cutting items from a sheet. 4,030,390, Cl. 83-123.000.

Helfert, Herbert: *See—*
Oppenlaender, Knut; Uhl, Guenter; Helfert, Herbert; Scharpenberg, Hans-Georg; and Stork, Karl, 4,031,112.

Helgorsky, Jacques, to Rhone-Poulenc Industries. Method of separating chlorinated aliphatic hydrocarbons from mixtures thereof by liquid-liquid extraction. 4,031,148, Cl. 260-652.00P.

Helmberger, Josef: *See—*
Wick, Richard; Bestenreiner, Friedrich; Deml, Reinhold; and Helmberger, Josef, 4,031,550.

Helsley, Grover C.; and Strupczewski, Joseph, to American Hoechst Corporation. Method of treating pain and hypertension. 4,031,221, Cl. 424-267.000.

Henderson, John Goodchilde Norie: *See—*
Rast, Robert Morgan; Wine, Charles Martin; and Henderson, John Goodchilde Norie, 4,031,549.

Hendricks, Lorenzo R. Nested hunting knife. 4,030,194, Cl. 30-143.000.

Hendry, James W.: *See—*
Reuschel, Donald L.; and Hendry, James W., 4,030,299.

Henegar, Dale L., to Lake Aid Inc. Floating aerator having means to vary the length of the draft pipe. 4,030,859, Cl. 417-61.000.

Heniser, Richard J.: *See—*
Miller, Stanley J.; and Heniser, Richard J., 4,030,432.

Hennessy, Robert Thomas: *See—*
Doobenen, William; and Hennessy, Robert Thomas, 4,030,221.

Henning, Klaus: *See—*
Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; Henning, Klaus; and Kandler, Joachim, 4,031,022.

Hercules Incorporated: *See—*
Bukowick, Peter Anthony, 4,030,912.
Merlette, John Barton, 4,030,754.

Herman, Edwin Bernard: *See—*
Haas, Gerhard Julius; Herman, Edwin Bernard; and Lugay, Joaquin Castro, 4,031,250.

Hervert, George L., to UOP Inc. Method for the preparation of an electrocatalyst. 4,031,292, Cl. 429-40.000.

Herzl, Peter J., to Fischer & Porter Co. Obstacle assembly for vortex type flowmeter. 4,030,355, Cl. 73-194.0VS.

Hess, Howard V.; Franz, William F.; and Cole, Edward L., to Texaco Inc. Process for making oil from aqueous reactive sludges and slurries. 4,030,981, Cl. 201-2.500.

Hesse, Jurgen: *See—*
Grund, Peter; Schmidt, Jurgen; and Hesse, Jurgen, 4,030,247.

Heyer Inc.: *See—*
Springer, Edward M., 4,030,412.

Hicks, Robert M. Combined leaching and sump catch-basin. 4,031,009, Cl. 210-164.000.

Hildebrand, Larry R.; and Carpenter, John F., to Packaging Corporation of America. Foldable support member and blank therefor. 4,030,604, Cl. 206-521.000.

Hill, David George: *See—*
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,031,102.

Hill, Ira D.: *See—*
Sanders, James Milton; Taylor, William I.; Hill, Ira D.; and Kryschuk, John J., 4,031,161.

Hill, John C., to Pro-Tec Industries. Apparatus for aligning hitches of towing and towed vehicles. 4,030,775, Cl. 280-477.000.

Hill, Lucius D. Manometric pressure sensing and liquid evacuating device for intraoperative hiatal hernia repair. 4,030,481, Cl. 128-2.00S.

Hill, William Frank, to Lucas Electrical Company Limited, The. Road vehicle electrical systems. 4,031,403, Cl. 290-38.00R.

Hilleman, Maurice R.: *See—*
Provost, Philip J.; Ittensohn, Oswald L.; and Hilleman, Maurice R., 4,031,203.

Hinden, Milton; and Giannone, Charles, to Duro-Dyne Corporation. Method of resistance welding. 4,031,350, Cl. 219-99.000.

Hippert, Lawrence, Jr. Tamper-proof container cap cover. 4,030,628, Cl. 220-85.00P.

Hirai, Hiroshi: *See—*
Ogawa, Yutaka; and Hirai, Hiroshi, 4,030,577.

Hiraku, Seizi: *See—*
Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Aishita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, 4,030,977.

Hirano, Koichi: *See—*
Itoh, Yasuo; Suzuki, Yoshitake; Shibutami, Hirohiko; Hirano, Koichi; and Tagami, Muneo, 4,030,533.

Hirano, Masachika: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,031,235.

Hirano, Shinji: *See—*
Hayashi, Masahiro; Haba, Masanori; Watanabe, Misuzu; and Hirano, Shinji, 4,031,498.

Hirosawa, Frank N.; and Lee, Ming H., to Furane Plastics, Inc. Polyurethane cross-linking agents. 4,031,049, Cl. 260-2.5AM.

Hirtle, Allen C., to Honeywell Information Systems, Inc. Emulation of target system interrupts through the use of counters. 4,031,517, Cl. 364-200.000.

Hiruma, Mituo, to Nissan Motor Co., Ltd. Suspension system. 4,030,739, Cl. 280-708.000.

Hiscoe, Ernest C., to Nashua Corporation. Apparatus and method for stacking rolls of pressure sensitive tape. 4,030,619, Cl. 214-6.00M.

Hishinuma, Yukio: *See—*
Akimoto, Hidetoshi; Kaji, Ryuichi; Kikuchi, Hideo; Hishinuma, Yukio; and Arikawa, Yoshijiro, 4,031,185.

Hitachi, Ltd.: *See—*
Adachi, Yoshio, 4,031,448.
Akimoto, Hidetoshi; Kaji, Ryuichi; Kikuchi, Hideo; Hishinuma, Yukio; and Arikawa, Yoshijiro, 4,031,185.
Fujiwara, Hideo; Ichinose, Yukio; Taniguchi, Satoshi; Kobayashi, Tsutomu; Ichino, Kazuo; Itoh, Michiyasu; Uesaka, Yasutaro; Inose, Fumiyuki; and Ueno, Sadayasu, 4,031,496.
Horie, Noboru, 4,030,954.
Isikawa, Tosio; Ozawa, Jun; and Kikuchi, Takehiro, 4,031,347.
Kaneko, Takashi; Yuminaka, Takeo; Iwasaka, Tatsuo; and Kinoshita, Hiroshi, 4,030,571.
Kaneko, Takashi; Iwasaka, Tatsuo; and Yuminaka, Takeo, 4,030,572.
Kihara, Toshimasa, 4,031,514.
Kikuchi, Tadao, 4,031,410.
Morooka, Yasuo; and Tanifuji, Shinya, 4,030,326.
Nobutoki, Saburo; Ogusu, Chihaya; and Sugimoto, Masao, 4,031,551.
Ohhinata, Ichiro; and Okuhara, Shinzi, 4,031,412.
Ohhinata, Ichiro; Okuhara, Shinzi; and Takeshita, Tetsuo, 4,031,413.
Onishi, Makoto; Nagano, Katsuyuki; Tanaka, Toshiki P.; Matsuoka, Sadao; and Tanaka, Mitsuo, 4,030,809.
Saiki, Yukimi; Ogino, Masanori; and Watanabe, Shutoku, 4,031,547.
Sakai, Yoshio; and Kurosawa, Toshiaki, 4,031,439.
Sasayama, Takao; and Nishimiya, Torazo, 4,030,462.
Shimada, Shunji; and Wakimoto, Harumi, 4,031,409.
Shimada, Shunji; Hatsukano, Yoshikazu; and Yamashiro, Osamu, 4,031,456.
Shinkawa, Keiro; Sodeyama, Chiuichi; Kaneko, Yoichi; and Kimura, Katsuhiro, 4,031,472.
Sonobe, Shigeru; Watanabe, Makoto; Kato, Iwao; and Sato, Tomoyoshi, 4,030,828.
Sugiura, Noboru; Mori, Yasunori; and Suda, Seiji, 4,030,468.
Takenaga, Hisayoshi; and Yotsukura, Teruo, 4,030,445.
Taneda, Yukinori; and Kobayashi, Takashi, 4,030,614.

Hitachi Metals, Ltd.: *See—*
Saka, Yoshimi, 4,030,535.

Hixenbaugh, Dennis L.: *See—*
Kniss, Edward L., Jr.; Hixenbaugh, Dennis L.; Maudlin, Jerry A.; and Brozenick, Nicholas J., 4,030,740.

Hock, Lester R., to Bevles Co., Inc. Heated cabinet for food. 4,030,476, Cl. 126-246.000.

Hoechst Aktiengesellschaft: *See—*
Gross, Erwin; and Vowinkel, Hans, 4,030,541.
Heiss, Lorenz, 4,031,136.
Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; Henning, Klaus; and Kandler, Joachim, 4,031,022.
Winkelmann, Erhardt; and Raether, Wolfgang, 4,031,232.

Hoefke, Wolfgang: *See—*
Losel, Walter; Traunecker, Werner; and Hoefke, Wolfgang, 4,031,212.

Hoesch Werke Aktiengesellschaft: *See—*
Schluter, Wilhelm; and Pohler, Heinz, 4,030,786.

Hoffman, Robert M.: *See—*
Blair, Michael A.; and Hoffman, Robert M., 4,030,158.

Hoffmann-La Roche Inc.: *See—*
Reif, Robert Bruce, 4,031,200.
Szente, Andre, 4,031,078.
Williams, Joseph James, 4,030,868.

Hoffmann, Werner; and Baumann, Manfred, to BASF Aktiengesellschaft. 12-Alkoxy-3,7,11-trimethyl-dodecatetraenes. 4,031,141, Cl. 260-614.00R.
Hoffmeister, Bernhard; and Dose, Gerhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Gripping device, especially for use in manipulating control bars in a nuclear reactor. 4,030,973, Cl. 176-36.00R.
Hofman, Emiel Alexander, to AGFA-GEVAERT N.V. Method of producing photographic images. 4,030,924, Cl. 96-61.00R.
Hokushin Electric Works, Ltd.: *See—*
Minami, Hiroshi, 4,031,503.
Hold, Peter, to USM Corporation. Controlled deflection roll. 4,030,177, Cl. 29-116.0AD.
Holfeld, Winfried Thomas; and Strohmaier, Alfred John, to Du Pont de Nemours, E. I., and Company. Process for improving dyeability. 4,030,880, Cl. 8-15.000.
Holland Company: *See—*
Chierici, Osvaldo F., 4,030,613.
Hollenbach, Roger C.: *See—*
Goldstein, David; Kibbel, William Henry, Jr.; and Hollenbach, Roger C., 4,031,090.
Holloran, Thomas Patrick; Braden, Arthur Buell; Foley, Jerrold Stokes; Maynard, James Lucian; Klosky, John Patrick; Dissauer, Gerald Anthony; Adams, Terrence Miller; and Lorenz, Allan Alfred, to Addressograph Multigraph Corporation. Data capture terminal. 4,031,518, Cl. 364-200.000.
Holly, Sandor, to Atlantic Research Corporation. Process and apparatus for sensing defects on a smooth surface. 4,030,830, Cl. 356-109.000.
Holmen, Reynold E.; and Olander, Stanley J., to Minnesota Mining and Manufacturing Company. Paint composition for marking paved surfaces. 4,031,048, Cl. 260-22.0CQ.
Holt, Jan D.: *See—*
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 4,030,424.
Holz, George E.; and Ogle, James A., to Burroughs Corporation. Information display and method of operating with storage. 4,031,429, Cl. 315-169.0TV.
Holz, George E., to Berkeley Varitronics Systems. Communication system. 4,031,543, Cl. 358-86.000.
Holz, George Ernest. Proximity switching system. 4,031,408, Cl. 307-116.000.
Holzbrecher, Horst, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Device for creating a display of a variable, the value of which is digitally encoded. 4,031,562, Cl. 346-35.000.
Holzl, Ludwig: *See—*
Reisinger, Konrad; and Holzl, Ludwig, 4,031,316.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hashimoto, Michiyoshi; and Shako, Hisahumi, 4,030,561.
Tanaka, Minoru; and Otaka, Syoichi, 4,030,460.
Honeywell Inc.: *See—*
Bernal G., Enrique; Koepke, Barry G.; and Maciolek, Ralph B., 4,031,190.
Honeywell Information Systems, Inc.: *See—*
Hirtle, Allen C., 4,031,517.
Honjo, Satoru; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Image recording method. 4,030,922, Cl. 96-1.00R.
Hood, Frederick E.; Mitchell, Donald K.; and Uhring, Gary S., to Hood Sailmakers, Inc. Boom gooseneck fitting providing mainsail roller-furling. 4,030,439, Cl. 114-106.000.
Hood, Henry Alexander, to Wall Industries, Inc. Faired article. 4,030,401, Cl. 87-6.000.
Hood Sailmakers, Inc.: *See—*
Hood, Frederick E.; Mitchell, Donald K.; and Uhring, Gary S., 4,030,439.
Hooker Chemicals & Plastics Corporation: *See—*
Bosa, Primo, 4,031,001.
Graham, John C., 4,031,142.
Graham, John C., 4,031,147.
Hooper, Gerald E., to Varian Associates. Keying waveform generator for spectrophotometer. 4,030,829, Cl. 356-97.000.
Hopkins, Donald L.: *See—*
Bridwell, John W.; Hopkins, Donald L.; and Lohbauer, Kenneth R., 4,030,623.
Hoppe, Walter, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Electron microscope including improved means for determining and correcting image drift. 4,031,391, Cl. 250-311.000.
Hori, Kenji; and Nakamura, Shigeo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Multicylinder engine. 4,030,459, Cl. 123-52.00M.
Horie, Noboru, to Hitachi, Ltd. Method of manufacturing a semiconductor integrated circuit device. 4,030,954, Cl. 156-628.000.
Horikoshi, Yoshiji; and Furukawa, Yoshitaka, to Nippon Telegraph and Telephone Public Corporation. Method of effecting liquid phase epitaxial growth of group III-V semiconductors. 4,030,949, Cl. 148-171.000.
Hornig, Carl F.; Kroupa, Kenneth M.; and Simpson, Earle E., to Western Electric Company, Inc. Method of hydrothermally growing quartz. 4,030,966, Cl. 156-623.00Q.
Horning, Bent, to F. L. Smidth & Co. Magazine for bags such as sacks. 4,030,528, Cl. 141-1.000.
Hornschu, Joachim; and Jung, Arthur, to Carl Zeiss-Stiftung, Carl Zeiss. Binocular telescope. 4,030,808, Cl. 350-36.000.
Horowitz, Robert M.: *See—*
Guadagni, Dante G.; Horowitz, Robert M.; Gentili, Bruno; and Maier, Vincent P., 4,031,265.
Horsten, Johannes Bernardus, to U.S. Philips Corporation. Integrated storage system with parallel connection lines containing a resistor. 4,031,523, Cl. 340-173.00R.
Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, to Canon Kabushiki Kaisha. Method for detecting visibility of image of an object and a device therefor. 4,031,383, Cl. 250-201.000.
Hoult, David P., to American Fish Company. Fish raising. 4,030,450, Cl. 119-3.000.
Houston, John M.: *See—*
Whetten, Nathan Rey; and Houston, John M., 4,031,396.
Howard, Fred, to Wix Corporation. Article display stand. 4,030,608, Cl. 211-131.000.
Howard, Harold P. Headrest. 4,030,781, Cl. 297-397.000.
Howell Instruments, Inc.: *See—*
Hartung, Robert L., 4,031,366.
Hoyt, Carl E.: *See—*
Carver, Fred F.; and Hoyt, Carl E., 4,030,208.
HPM Corporation: *See—*
Myers, Gary L.; and Staiger, Donald W., 4,030,186.
Hubatsch, Gotthard: *See—*
Chitil, Manfred; and Hubatsch, Gotthard, 4,031,309.
Hubbard, James L. Food processing apparatus. 4,030,162, Cl. 17-1.00R.
Huellwegen, Josef, to Nixdorf Computer AG. Circuit arrangement for the ungrounded transmission of signals through testing points in communication systems. 4,031,480, Cl. 330-10.000.
Hughes Aircraft Company: *See—*
Buchman, William W., 4,030,686.
Lee, Don H.; Weller, Kenneth P.; and Thrower, William F., 4,030,943.
Miller, Leroy J.; and Grinberg, Jan, 4,030,997.
Wilmot, Richard D., 4,031,364.
Hughes, Theodore R.; and McCarty, Glenn L. Reel-to-reel tape to tape cartridge adapter. 4,031,555, Cl. 360-94.000.
Hunt, Gary: *See—*
Linck, Donald W., II; and Kaprelian, George, 4,030,197.
Hunt Manufacturing Co.: *See—*
Alexander, Robert L., 4,030,610.
Hunt, Robert P.; and Steffek, Robert J., to Picker Corporation. X-ray soft filmer. 4,031,400, Cl. 250-468.000.
Husky, Glover A. Field to gin cotton handling and storge systems. 4,031,003, Cl. 209-3.000.
Hutai, Hubert: *See—*
Schwuchow, Norbert; and Hutai, Hubert, 4,030,744.
Hutchinson, John Jefferson: *See—*
Anthony, Andrew James; and Hutchinson, John Jefferson, 4,030,975.
Huthwelker, Dirk: *See—*
Franz, Arnold; Huthwelker, Dirk; and Jacob, Lothar, 4,031,313.
Hyde, George S., to United States of America, Army. Interlocked joint. 4,030,850, Cl. 403-288.000.
Hydril Company: *See—*
Mott, James D., 4,030,550.
Hydrometals, Inc.: *See—*
Borys, Emil G., Jr., 4,031,540.
I-T-E Imperial Corporation: *See—*
Eidelberg, Jonah; and Mooney, Thomas, 4,030,742.
I-T-E Imperial Corporation EFCOR Division: *See—*
Shemtov, Sami, 4,030,153.
Ibbotson, Arthur, to Imperial Chemical Industries Limited. Diphenylmethane diisocyanate compositions. 4,031,026, Cl. 252-182.000.
Ichikawa, Kazuo, to Olympus Optical Co., Ltd. A.C. voltage regulator employing thyristor. 4,031,458, Cl. 323-36.000.
Ichino, Kazuo: *See—*
Fujiwara, Hideo; Ichinose, Yukio; Taniguchi, Satoshi; Kobayashi, Tsutomu; Ichino, Kazuo; Itoh, Michiyasu; Uesaka, Yasutaro; Inose, Fumiyuki; and Ueno, Sadayasu, 4,031,496.
Ichinose, Yukio: *See—*
Fujiwara, Hideo; Ichinose, Yukio; Taniguchi, Satoshi; Kobayashi, Tsutomu; Ichino, Kazuo; Itoh, Michiyasu; Uesaka, Yasutaro; Inose, Fumiyuki; and Ueno, Sadayasu, 4,031,496.
ICI Australia Limited: *See—*
Forsyth, Bruce Adam; Pryor, David Ernest; McGarry, Errol James; and Harney, Donald William Gerald, 4,031,249.
Idel, Karsten-Josef; Saleck, Wilhelm; Wolff, Erich; and Freitag, Dieter, to AGFA-Gevaert, A.G. Photographic silver halide emulsion. 4,030,929, Cl. 96-114.000.
IDN Inventions and Development of Novelties AG: *See—*
Ackeret, Peter, 4,030,601.
Iglesias, Jose Juan. Anti-arcing resectoscope. 4,030,502, Cl. 128-303.150.
Iljima, Zenshiro, to Kawamura Seichu Kogyo Kabushiki Kaisha. Coloring composition for line- or pattern- drawing elements. 4,030,934, Cl. 106-23.000.
Iliev, Iliya Dimitrov: *See—*
Budevski, Evgueni Bogdanov; Iliev, Iliya Dimitrov; Kaisheva, Anastasiya Rostislavova; Gamburtzev, Sergei Sergeev; and Vakanova, Elena Borisova, 4,031,033.
Imperial Chemical Industries Limited: *See—*
Barrault, Michel Raymond, 4,030,998.
Boyd, Violet; Fishwick, Brian Ribbons; and Glover, Brian, 4,030,881.
Ibbotson, Arthur, 4,031,026.
Inazaki, Tsunenori: *See—*
Ogawa, Yoshihisa; Inazaki, Tsunenori; and Kouda, Michihiro, 4,031,194.

Indicon Inc.: *See—*
Citrin, Paul S.; and Gurski, Frank, 4,030,640.

Industriewerke Karlsruhe Augsburg Aktiengesellschaft: *See—*
Enneking, Heinrich; Schubert, Gunter; and Baumann, Karl-Heinz, 4,030,169.

Ing. Alfred Schmidt GmbH: *See—*
Mutter, Werner, 4,030,380.

Ing. C. Olivetti & C., S.p.A.: *See—*
Longa, Pier Luigi; and Gamba, Piero, 4,031,452.

Ing. Polin & C di Polin Ing. Antonio & C. S.a.s.: *See—*
Polin, Antonio, 4,030,594.

Ingenior F. Selmer A/S: *See—*
Einstabland, Tomas Berge; and Opedal, Torlak, 4,030,864.

Ingersoll-Rand Company: *See—*
Poe, Curtis Eugene; and Cheers, Ronald Murray, 4,030,542.

Ingraham, Glen E., to Colorguard Corporation. Insulated and grounded fence fabric. 4,031,284, Cl. 428-222.000.

Ingram, Arthur: *See—*
Linck, Donald W., II; and Kaprelian, George, 4,030,197.

Ingrey, Sidney Ivor Joseph; Nentwich, Heinz Josef; and Poulsen, Robert Gordon, to Northern Telecom Limited. Gaseous plasma etching of aluminum and aluminum oxide. 4,030,967, Cl. 156-643.000.

Innovative Electronics, Inc.: *See—*
Pitre, Lester M., 4,031,318.

Inose, Fumiyuki: *See—*
Fujiwara, Hideo; Ichinose, Yukio; Taniguchi, Satoshi; Kobayashi, Tsutomu; Ichino, Kazuo; Itoh, Michiyasu; Uesaka, Yasutaro; Inose, Fumiyuki; and Ueno, Sadayasu, 4,031,496.

Inoue, Naohiko: *See—*
Yanagishima, Takayuki; and Inoue, Naohiko, 4,031,527.

Insolio, Thomas A., to Fletcher-Terry Company, The. Scoring device with edge guide. 4,030,195, Cl. 30-164.900.

Institut National de la Sante et de la Recherche Medicale (Inserm): *See—*
Delhaye, Michel; Moschetto, Yves J. M.; and Dhamelincourt, Paul, 4,030,827.

Institutul de Cercetare Proiectare si Documentare Pentru Industria Materialelor de Constructii: *See—*
Stanasila, Virgil Corneliu; Florica, Mihai; and Lungu, Onut Antoniu, 4,030,879.

Instrulab Incorporated: *See—*
Aneshansley, Nicholas E., 4,031,530.

Intel Corporation: *See—*
Schwartz, Samuel, 4,031,379.

Interlake, Inc.: *See—*
Marlin, Louis Allen; and Beaucaire, Victor D., 4,030,894.

InterMed, Inc.: *See—*
Wolfe, Gerald W., 4,030,142.

International Business Machines Corporation: *See—*
Findley, Gerald I., 4,031,519.
Hall, Phil H.; and Irwin, John W., 4,031,521.
Keenan, William Andrew; and Kroll, Charles Thomas, 4,030,942.
Krause, Donald Lester; and Presley, Kenneth Dale, 4,030,923.
Martin, Blair Robertson; Meier, Johann Hans; and Raider, Jerry Wesley, 4,030,591.
Varker, Kenneth James, 4,030,190.

International Environmental Dynamics: *See—*
Labie, Allan S.; Thornton, Charles; Lew, Irwin Paul; and Gutman, Abraham, 4,030,257.

International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., 4,031,256.
Sanders, James Milton; Taylor, William I.; Hill, Ira D.; and Kryschuk, John J., 4,031,161.
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,031,140.
Wilson, Richard A.; Pascale, John V.; and Vock, Manfred Hugo, 4,031,257.
Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., 4,031,034.

International Harvester Company: *See—*
Boetto, Charles; Orkwiszewski, Wayne L.; and Connor, Donald E., 4,030,551.
Cremer, George D.; and Long, John V., 4,031,279.

International Nuclear Fuel Co., Ltd.: *See—*
Morita, Masato; Morita, Reiko; and Otozai, Kiyoteru, 4,031,388.

International Telephone and Telegraph Corporation: *See—*
Aronoff, Elihu J.; and Dhami, Kewal Singh, 4,031,167.
Clark, James Monroe, 4,031,478.
Fouratt, George Thomas, 4,031,333.
Kern, Edmund R., 4,031,426.
Langenbach, Jack E., 4,030,803.
Nieman, Gerald R., 4,030,797.
Saxon, B. Ronald, 4,031,329.

Intertechnique S.A.: *See—*
Giraud, Pierre; Palais, Conrad; and Rapkin, Edward, 4,031,392.

Inverness Corporation: *See—*
Mann, Samuel, 4,030,507.

Irik, Harry: *See—*
Beierle, Carl; and Irik, Harry, 4,030,704.

Ironside's Machine & Welding Ltd.: *See—*
Nyssen, Adrianus Marinus; and Rauch, Gerhard Josef, 4,030,330.

Irvine, Robert; and Luperti, Harry E., to Pitney-Bowes, Inc. Sheet-material separator and feeder system. 4,030,722, Cl. 271-10.000.

Irvine, Robert; and Luperti, Harry E., to Pitney-Bowes, Inc. Vacuum-controlled, sheet-material separator and feeder system. 4,030,723, Cl. 271-11.000.

Irwin, John W.: *See—*
Hall, Phil H.; and Irwin, John W., 4,031,521.

Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; Taniyasu, Ryozo; and Nagayama, Masuzo, to Lion Fat & Oil Co., Ltd. Method for preparation of polyolefin oil. 4,031,158, Cl. 260-683.15B.

Isbister, Eric J., to Sperry Rand Corporation. Multiple frequency navigation radar system. 4,031,535, Cl. 343-6.50R.

Ishida, Teisuke, to Japan Patent Center Inc. Compressed air generating device for forklift trucks. 4,030,294, Cl. 60-407.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Ogawa, Yutaka; and Hirai, Hiroshi, 4,030,577

Ishizawa, Seiya: *See—*
Ishizawa, Toushichi, 4,030,951.

Ishizawa, Toushichi, to Fuji Sangyo Kabushiki Kaisha; and Ishizawa, Seiya. Method of hardening saw teeth. 4,030,951, Cl. 148-147.000.

Isikawa, Tosio; Ozawa, Jun; and Kikuchi, Takehiro, to Hitachi, Ltd. Protective gas cap for electric power apparatuses. 4,031,347, Cl. 200-148.00B.

Isobe, Mitsuhide, to Shimano Industrial Company, Limited. Front derailleur for bicycle. 4,030,374, Cl. 74-217.00B.

Isono, Tomoyuki: *See—*
Suda, Kazuyoshi; Isono, Tomoyuki; Uchida, Takashi; and Tsuda, Kiyoshi, 4,030,607.

Itagaki, Tadasi, to Pioneer Electronic Corporation; and Tokorozawa Electronic Corporation. Loud speaker with stable damping. 4,030,564, Cl. 181-166.000.

Itaya, Nobushige: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,031,235.

Ito, Kakutaro, to Ito, Kakutaro; and Katoh, Yuzoh. One-piece sandal made from a flat sheet. 4,030,212, Cl. 36-11.500.

Ito, Susumu: *See—*
Asao, Makoto; Ito, Susumu; and Umehara, Hidetoshi, 4,031,171.

Ito, Yasuo; and Suzuki, Yoshitake, to Nippon Steel Corporation. Apparatus for continuous casting using linear magnetic field for core agitation. 4,030,534, Cl. 164-147.000.

Itoh, Hirotaka: *See—*
Nagata, Yasunori; Itoh, Hirotaka; Yazaki, Susumu; Hamamura, Takayuki; and Yoshiya, Shigeo, 4,030,884.

Itoh, Michiyasu: *See—*
Fujiwara, Hideo; Ichinose, Yukio; Taniguchi, Satoshi; Kobayashi, Tsutomu; Ichino, Kazuo; Itoh, Michiyasu; Uesaka, Yasutaro; Inose, Fumiyuki; and Ueno, Sadayasu, 4,031,496.

Itoh, Yasuo; Suzuki, Yoshitake; Shibutami, Hirohiko; Hirano, Koichi; and Tagami, Muneo, to Nippon Steel Corporation; and Kabushiki Kaisha Yaskawa Denki Seisakusho. Continuous casting system. 4,030,533, Cl. 164-147.000.

ITT Industries, Incorporated: *See—*
Hahm, Heinz Gunter; and Pocci, Nedo Igor, 4,030,185.
Schat, Hermannus; and Freyberger, Laurin Clemens, 4,031,411.

Ittensohn, Oswald L.: *See—*
Provost, Philip J.; Ittensohn, Oswald L.; and Hilleman, Maurice R., 4,031,203.

Itus Patent Holding (IPH) N.V.: *See—*
Raggiotti, Guglielmo; and Colonnelli, Domenico, 4,031,365.

Iwasaka, Tatsuo: *See—*
Kaneko, Takashi; Yuminaka, Takeo; Iwasaka, Tatsuo; and Kinoshita, Hiroshi, 4,030,571.
Kaneko, Takashi; Iwasaka, Tatsuo; and Yuminaka, Takeo, 4,030,572.

J. I. Case Company: *See—*
Baylor, John Merlin, 4,030,782.
Khatti, Ramkishan; and Lourigan, Patrick M., 4,030,295.
Parquet, Donald J.; and Pedersen, Carl O., 4,030,560.

J. M. Huber Corporation: *See—*
Kunkle, Albert C.; and Kollmar, Carl E., Jr., 4,030,941.

Jablecki, Elizabeth S. Liquid phase separator with valved outlet means. 4,031,032, Cl. 210-474.000.

Jachimowicz, Ludwik, to General Cable Corporation. Shrinkable electrical cable core for cryogenic cable. 4,031,310, Cl. 174-15.00C.

Jackson, Edgar D., to Steel Web Corporation. Wood rivet and method of installation in a truss. 4,030,264, Cl. 52-693.000.

Jackson, George J.: *See—*
Cobb, Delwin E.; Jackson, George J.; Livesay, Richard E.; and Stemler, Orrin A., 4,030,566.

Jackson, Richard A.; and Bolles, Theodore F., to Minnesota Mining and Manufacturing Company. Technetium-labeled complexes, production and use thereof. 4,031,198, Cl. 424-1.000.

Jackson, Thomas E., to Sandoz, Inc. Substituted 2H,3H-2,1-benzinothiazole-S-oxides, method of use and pharmaceutical compositions thereof. 4,031,227, Cl. 424-270.000.

Jacob, Daniel, to American Science & Engineering, Inc. Radiant energy imaging scanning. 4,031,401, Cl. 250-503.00.

Jacob, Friedrich; Voigt, Gerhard; and Frank, Freidheim, to Volkswagenwerk Aktiengesellschaft. Bumper arrangement and connection. 4,030,735, Cl. 293-71.00R.

Jacob, Friedrich; and Morsch, Dieter, to Volkswagenwerk Aktiengesellschaft. Frame. 4,030,772, Cl. 280-106.00R.

Jacob, Lothar: *See—*
Franz, Arnold; Huthwelker, Dirk; and Jacob, Lothar, 4,031,313.

Jaeger: *See—*
Dussartre, Roger, 4,030,367.

Jagenberg-Werke AG: *See—*
Vetten, Wilhelm, 4,030,616.
Jakobsson, Goran: *See—*
Colding, Bertil; Novak, Arne; Sandstrom, Unto; and Jakobsson, Goran, 4,031,368.
Jameel, Khaja M.; Mueller, Von W.; and Foerster, Ronald A., to GTE Automatic Electric Laboratories Incorporated. Device for measuring the magnetic flux distribution along the length of elongated magnetized element. 4,031,460, Cl. 324-34.00R.
James, Dean B.: *See—*
Colter, John Cecil; James, Dean B.; Keith, Walter Gill; and Akbari-Kenari, Reza, 4,031,029.
Jan Leloux, Arnoldus Willem, to Wavin B.V. Method of manufacturing plastic bags in a continuous way. 4,030,956, Cl. 156-290.000.
Janssen, Paul Adriaan Jan: *See—*
Soudijn, Willem; van Wijngaarden, Ineke; and Janssen, Paul Adriaan Jan, 4,031,226.
Janssen Pharmaceutica N.V.: *See—*
Soudijn, Willem; van Wijngaarden, Ineke; and Janssen, Paul Adriaan Jan, 4,031,226.
Japan Patent Center Inc.: *See—*
Ishida, Teisuke, 4,030,294.
Jaquith, Burton Kent, to Technical Industries, Inc. Continuous weighing mechanism for fluids. 4,030,356, Cl. 73-195.000.
Jaskulke, Gerhard; Schwarz, Alois; and Rutter, Armin, to Siemens Aktiengesellschaft. Arrangement for fault diagnosis in the communication controller of a program controlled data switching system. 4,031,375, Cl. 235-153.0AK.
Jasulaitis, William A.: *See—*
Gorin, Everett; Jasulaitis, William A.; Theodore, Frank W.; and Wasson, George E., 4,030,982.
Jefferson, Eva Imogene: *See—*
York, Alvin, 4,030,654.
Jerabek, Robert D., to PPG Industries, Inc. Cationic electrodepositable compositions of blocked NCO and acid salt of adduct of amine and polyepoxide. 4,031,050, Cl. 260-29.2TN.
Jeschke, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Sheet transfer device for printing presses. 4,030,727, Cl. 271-276.000.
Jesty, Thomas William; Anderson, John; and 53, to T.W. Jesty & Partners. Binding apparatus. 4,030,407, Cl. 100-4.000.
Jeumont-Schneider: *See—*
Le Comte, Michel L., 4,031,378.
Jewett, Harold A. Pool diver safety and research apparatus. 4,030,147, Cl. 4-172.000.
Jin, Jung Il, to Stauffer Chemical Company. Flame-retardant binder comprising vinylidene halide-bis(hydrocarbyl)vinyl phosphonate polymer latices blended with antimony oxide and chloroparaffin. 4,031,054, Cl. 260-29.60T.
John Wyeth & Brother Limited: *See—*
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,031,102.
Johnson, Curtis A.; and Prochazka, Svante, to General Electric Company. Strength improvement in machined SiC bodies. 4,031,178, Cl. 264-65.000.
Johnson, David W. Inflatable streamlining structure for vehicles. 4,030,779, Cl. 296-1.00S.
Johnson, Dennis L.: *See—*
Ramirez, Ernest R.; and Johnson, Dennis L., 4,031,006.
Johnson, Edgar A., to Singer Company, The. Receiver gain calibration. 4,031,469, Cl. 325-363.000.
Johnson & Johnson: *See—*
Sung, Pei; and Schweder, Frederic James, 4,030,918.
Johnson, Melvin Kermit; and Pilarski, Regis Victor, to Firestone Tire & Rubber Company, The. Carrier support apparatus. 4,030,648, Cl. 224-31.000.
Johnson, Ronald P.; and Bell, Reynold W., to Singer Company, The. Traffic controller, electromechanical sequencer for a traffic controller. 4,031,507, Cl. 340-41.00R.
Johnson, Wayne F.: *See—*
Bauer, Martin L.; Johnson, Wayne F.; and Lakomy, Dale G., 4,030,834.
Johnson, Wayne O., to Rohm and Haas Company. Process for preparing phenoxybenzoic acids. 4,031,131, Cl. 260-473.00G.
Johnston, Howard, to Dow Chemical Company, The. Substituted pyridinyloxy(thio)phenyl -acetamides, -ureas and urea derivatives, herbicidal compositions and methods containing same. 4,030,910, Cl. 71-94.000.
Jones, Gary E. Paper stacker. 4,030,720, Cl. 270-61.00F.
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, to Abbott Laboratories. Diacylated derivatives of γ-glutamyl dopamine. 4,031,242, Cl. 424-311.000.
Josef Bautz GmbH: *See—*
Reber, Erwin; and Schollhorn, Fritz, 4,030,274.
Joslyn, Wallace G., to Dow Corning Corporation. Polyether based, high resilient polyurethane foam. 4,031,044, Cl. 260-2.5AH.
Juby, Peter Frederick; and Partyka, Richard Anthony, to Bristol-Myers Company. 1,6-Dihydro-6-oxo-2-(ortho-substituted phenyl)pyrimidine-5-carboxylic acid derivatives. 4,031,093, Cl. 260-251.00R.
Juillard, Michel: *See—*
Bouy, Pierre; Juillard, Michel; and Bourgeois, Jean-Luc, 4,031,041.
Jung, Arthur: *See—*
Hornschu, Joachim; and Jung, Arthur, 4,030,808.
Junge, Karl-Wilhelm: *See—*
Gahler, Siegfried; Junge, Karl-Wilhelm; Fischer, Gunther; Scheithauer, Steffen; and Viola, Horst, 4,030,928.
Jurischka, Hans-Dieter: *See—*
Heinroth, Karl-August; Dietrich, Theo; Bach, Hans; and Jurischka, Hans-Dieter, 4,030,278.
Juste, S.A. Quimico-Farmaceutica: *See—*
Aparicio, Luis; Gayo, Nenesio; M^a ; Martin, Jose Luis; and Ron, Armando, 4,031,243.
Justus, Edgar J., to Beloit Corporation. System compensating for pressure fluctuations in a paper machine headbox. 4,030,971, Cl. 162-216.000.
Juusela, Jyrki Tapani: *See—*
Aaltonen, Olavi August; Andersson, Bengt Torsten; Juusela, Jyrki Tapani; Palperi, Matti Johannes; and Tuominen, Tapio Kalevi, 4,030,915.
Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Buttner, Karl; Boll, Jurgen; and Wolfel, Kurt, 4,030,174.
Kabushiki Kaisha Japan Metal Finishing Company: *See—*
Fujita, Shigeru; Murayama, Koichi; and Kaneda, Toyohito, 4,030,987.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
Kugisawa, Toshio, 4,030,395.
Kabushiki Kaisha Meidensha: *See—*
Hayashi, Masahiro; Haba, Masanori; Watanabe, Misuzu; and Hirano, Shinji, 4,031,498.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Miyamoto, Noriaki, 4,030,372.
Kabushiki Kaisha Yaskawa Denki Seisakusho: *See—*
Itoh, Yasuo; Suzuki, Yoshitake; Shibutami, Hirohiko; Hirano, Koichi; and Tagami, Muneo, 4,030,533.
Kadatz, Rudolf: *See—*
Kutter, Eberhard; Austel, Volkhard; Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; Lillie, Christian; and Kadatz, Rudolf, 4,031,219.
Kadin, Saul B.; and Moore, Peter F., to Pfizer Inc. 1-Oxo-1H-6-substituted-pyrimido(1,2-a)-quinoline-2-carboxylic acids and esters useful as antiulcer agents. 4,031,217, Cl. 424-251.000.
Kadowaki, Hidejiro: *See—*
Takahashi, Toru; Nakahata, Kimio; and Kadowaki, Hidejiro, 4,030,447.
Kagaya, Mineo: *See—*
Sugiura, Kensuke; Kagaya, Mineo; Fujisou, Tokuo; Aoki, Hiroyuki; Takehara, Takeichiro; and Kurata, Shigenori, 4,031,020.
Kahan, Frederick M., to Merck & Co., Inc. Antibacterial composition comprising 3-fluoro-D-alanine or deutero analog in combination with auto-antagonist inhibitor. 4,031,231, Cl. 424-272.000.
Kahaner, Joel M., to Goodyear Tire & Rubber Company, The. Method and apparatus for splicing tire cord fabric. 4,030,653, Cl. 227-25.000.
Kaiser, Peter, to Bell Telephone Laboratories, Incorporated. Method for drawing fibers. 4,030,901, Cl. 65-2.000.
Kaisheva, Anastasiya Rostislavova: *See—*
Budevski, Evgueni Bogdanov; Iliev, Iliya Dimitrov; Kaisheva, Anastasiya Rostislavova; Gamburtzev, Sergei Sergeev; and Vakanova, Elena Borisova, 4,031,033.
Kaji, Ryuichi: *See—*
Akimoto, Hidetoshi; Kaji, Ryuichi; Kikuchi, Hideo; Hishinuma, Yukio; and Arikawa, Yoshijiro, 4,031,185.
Kajita, Yasumichi: *See—*
Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Aishita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, 4,030,977.
Kaken Chemical Co., Ltd.: *See—*
Sasaki, Kazuya; Naito, Takanobu; Momoki, Yoshio; Sega, Toshio; and Satomi, Toshiyuki, 4,031,215.
Kalal, Jaroslav; Coupek, Jiri; Pokorny, Svatopluk; Svec, Frantisek; and Bouchal, Karel. Three-dimensional polymeric gel materials containing phosphoric acid residues capable of dissociation and a method for their preparation. 4,031,037, Cl. 260-2.20R.
Kali-Chemie Aktiengesellschaft: *See—*
Becher, Wilfried; and Massonne, Joachim, 4,031,193.
Kallmann, George T.; and Waddell, Theodore P., to United States of America, Navy. Noise resistant zone penetration detection system. 4,031,534, Cl. 343-12.0MD.
Kalopissis, Gregoire; and Bugaut, Andree, to Societe Anonyme dite: L'Oreal. 2-Amino-4-hydroxy-5-chloro toluene and the hydrochloride thereof. 4,031,160, Cl. 260-575.000.
Kalopissis, Gregoire; and Vanlerberghe, Guy, to Societe Anonyme dite: L'Oreal. Manufacture of food powders. 4,031,263, Cl. 426-588.000.
Kamas Industri Aktiebolag: *See—*
Borgqvist, Lennart Rickard, 4,030,672.
Kammerer, Archer W., Jr.; and Curington, Alfred R., to Bakerdrill, Inc. Bore hole airhammer and anvil bit. 4,030,554, Cl. 173-17.000.
Kampe, Robert F., to Chandler Evans Inc. Thrust augmentation technique and apparatus. 4,030,289, Cl. 60-204.000.
Kamyr Aktiebolag: *See—*
Skretting, Arne, 4,031,013.
Kandler, Joachim: *See—*
Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; Henning, Klaus; and Kandler, Joachim, 4,031,022.
Kanebo, Ltd.: *See—*
Nagata, Yasunori; Itoh, Hirotaka; Yazaki, Susumu; Hamamura, Takayuki; and Yoshiya, Shigeo, 4,030,884.

Kaneda, Toyohito: *See—*
Fujita, Shigeru; Murayama, Koichi; and Kaneda, Toyohito, 4,030,987.
Kanegafuchi Chemical Industries Co., Ltd.: *See—*
Suzuki, Kazuo; Hayashi, Yoshiaki; and Nagamine, Seiichi, 4,031,287.
Kaneko, Takashi; Yuminaka, Takeo; Iwasaka, Tatsuo; and Kinoshita, Hiroshi, to Hitachi, Ltd. Elevator control system. 4,030,571, Cl. 187-29.00R.
Kaneko, Takashi; Iwasaka, Tatsuo; and Yuminaka, Takeo, to Hitachi, Ltd. Elevator control apparatus. 4,030,572, Cl. 187-29.00R.
Kaneko, Yoichi: *See—*
Shinkawa, Keiro; Sodeyama, Chiuichi; Kaneko, Yoichi; and Kimura, Katsuhiro, 4,031,472.
Kanner, Bernard: *See—*
Prokai, Bela; and Kanner, Bernard, 4,031,042.
Kantz, Don B.; and Lezotte, Tim F., to Ford Motor Company. Hydrogen compression system for Stirling engine power control. 4,030,297, Cl. 60-521.000.
Kapl, Ladislav: *See—*
Rambousek, Miroslav; Kapl, Ladislav; and Mladek, Milos, 4,030,279.
Kaprelian, George: *See—*
Linck, Donald W., II; and Kaprelian, George, 4,030,197.
Karady, Sandor; and Amato, Joseph S., to Merck & Co., Inc. Process for cleavage of 7-amino-adipoylamino side chain in cephalosporins. 4,031,086, Cl. 260-243.00C.
Karlsson, Tom Orvar Bjorn, to Nordnero AB. Method for liquid level control. 4,030,521, Cl. 137-566.000.
Karp, Joel Allen: *See—*
Reed, John Anthony; and Karp, Joel Allen, 4,031,522.
Karr, Allan V., to Electrostatic Equipment Corporation. Directed flow ionization chamber in electrostatic coating. 4,030,446, Cl. 118-654.000.
Kashio, Toshio, to Casio Computer Co., Ltd. Apparatus for transmitting changeable length records having variable length words with interspersed record and word positioning codes. 4,031,515, Cl. 364-200.000.
Kashio, Toshio, to Casio Computer Co., Ltd. Transmission data processing device. 4,031,516, Cl. 364-200.000.
Kasik, Robert L.; and Peterson, Marvin A., to Beatrice Foods Co. Instant cheese, cheese sauces and related compositions. 4,031,254, Cl. 426-573.000.
Kastning, Ernst-Guenther: *See—*
Bronstert, Klaus; Fahrbach, Gerhard; Krahe, Eduard; Ladenberger, Volker; Kastning, Ernst-Guenther; Mittnacht, Hans; Willersinn, Herbert; and Trieschmann, Hans-Georg, 4,031,166.
Kasuga, Akira: *See—*
Suzuki, Osamu; Akashi, Goro; Kasuga, Akira; and Sega, Kenji, 4,030,685.
Kathawala, Faizulla G., to Sandoz, Inc. Phenoxyphenyl imidazolyl methanols and ketone derivatives thereof. 4,031,233, Cl. 424-273.000.
Kato, Iwao: *See—*
Sonobe, Shigeru; Watanabe, Makoto; Kato, Iwao; and Sato, Tomoyoshi, 4,030,828.
Kato, Mikio, to Nippon Felt Co., Ltd. Bed for the invalid. 4,030,149, Cl. 5-90.000.
Kato, Yoshiro; and Fujita, Choichi, to Sony Corporation. Plural receiving and recording television system. 4,031,548, Cl. 358-188.000.
Katoh, Yuzoh: *See—*
Ito, Kakutaro, 4,030,212.
Katz, Ira: *See—*
Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., 4,031,034.
Kaufmann, Wilfried: *See—*
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,207.
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Karl Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,208.
Kaut, William, Jr. Leakproof coupling means for garden hoses and the like. 4,030,778, Cl. 285-174.000.
Kawakami, Katsuhiko: *See—*
Yamaguchi, Kineo; Kawakami, Katsuhiko; and Nakamoto, Yukimasa, 4,031,031.
Kawamura Seichu Kogyo Kabushiki Kaisha: *See—*
Iljima, Zenshiro, 4,030,934.
Kawasaki, Kunijiro: *See—*
Nagata, Toshio; Kawasaki, Kunijiro; Takahama, Ryuichiro; Miyatani, Yoshifusa; and Funakoshi, Sozo, 4,030,441.
Kawneer Company, Inc.: *See—*
Sukolics, Ronald D.; and Biebuyck, Lawrence F., 4,030,260.
Kazahaya, Masahiro; and Bonner, John J., to Fischer & Porter Co. Pressure transmitter. 4,030,366, Cl. 73-406.000.
Keasling, David E. Knurling tool. 4,030,331, Cl. 72-110.000.
Keedy, David Edward: *See—*
Davis, Warren Wiley; and Keedy, David Edward, 4,030,288.
Keeling, Ronald James, to Formica Corporation. Flocked metallic laminated wallcoverings. 4,031,281, Cl. 428-90.000.
Keen, Everett M.; and Siciliano, Anthony J., to Diamond International Corporation. Feed dispensing hopper. 4,030,452, Cl. 119-52.00B.
Keenan, William Andrew; and Kroll, Charles Thomas, to International Business Machines Corporation. Semiconductor masking for device fabrication utilizing ion implantation and other methods. 4,030,942, Cl. 148-1.500.
Keezer, Richard C.: *See—*
Griffiths, Clifford H.; and Keezer, Richard C., 4,031,109.
Kefauver, Bernard C.; and Little, Norman, to United States of America, Health, Education and Welfare. Apparatus for capping and uncapping containers. 4,030,271, Cl. 53-305.000.
Keifert, Hibbard G.; and Waters, Frank J., deceased (by Waters, Ethel M., administratrix), to Fansteel Inc. Lined equipment with dual base metal inserts. 4,030,848, Cl. 403-272.000.
Keifert, Hibbard G.; and Waters, Frank J., deceased (by Waters, Ethel M., administratrix), to Fansteel Inc. Lined equipment and method of fabrication. 4,030,849, Cl. 403-272.000.
Keith, Thomas R., Jr., to Continental Oil Company. Transducer positioner for testing tubes from inside diameter. 4,030,370, Cl. 73-67.80S.
Keith, Walter Gill: *See—*
Colter, John Cecil; James, Dean B.; Keith, Walter Gill; and Akbari-Kenari, Reza, 4,031,029.
Keller Corporation, The: *See—*
Keller, Leonard J., 4,030,893.
Keller & Knappich Augsburg Zweigneiderlassung der Industrie-Werke Karlsruhe Augsburg Aktienegesellschaft: *See—*
Richter, Hans, 4,030,617.
Keller, Leonard J., to Keller Corporation, The. Method of preparing low-sulfur, low-ash fuel. 4,030,893, Cl. 44-1.00B.
Kelley, Norman S.; and Pearne, Florentin J., to Aircraft Mechanics, Inc. Semi-automatic palletizer. 4,030,618, Cl. 214-6.00P.
Kelvinator, Inc.: *See—*
Bunce, Donald A., 4,030,870.
Kemper, Eugene L. Heating treatment method and system of utilizing same. 4,030,947, Cl. 148-12.900.
Kendall Company, The: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,030,497.
Hasty, James H., 4,030,488.
Kennedy, Joseph P.: *See—*
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 4,031,300.
Kenny, Garry R.: *See—*
Sommer, Edward J., Jr.; Kenny, Garry R.; Knoll, Frank S.; and Mitchell, David W., 4,031,004.
Kent, David Earl: *See—*
Dempsey, Edward Justin; and Kent, David Earl, 4,031,437.
Kenyon, David L. Padlock with protected slide bolt and locking means. 4,030,321, Cl. 70-34.000.
Kern, Edmund R., to International Telephone and Telegraph Corporation. Emissive coating for electrodes. 4,031,426, Cl. 313-346.00R.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Guggi, Diether Josef; and Klein, Rolf, 4,030,615.
Holzbrecher, Horst, 4,031,562.
Neef, Hanns-Joachim, 4,030,974.
Kersten, Gunter: *See—*
Aldinger, Ulrich; and Kersten, Gunter, 4,030,405.
Keske, Frank E., to Caterpillar Tractor Co. Rotary drive assembly. 4,030,377, Cl. 74-412.00R.
KESO AG: *See—*
Ehrat, Kurt, 4,030,325.
Kessler, Clarence W., to NCR Corporation. Data processing machine. 4,030,589, Cl. 197-1.00R.
Kessler, Saul, to Aidlin, Joseph W. Chemical surface coating bath. 4,031,027, Cl. 252-186.000.
Khaber, Nikolai Vasilievich: *See—*
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.
Khanna, Satya Pal, to Bell Telephone Laboratories, Incorporated. Hybrid integrated circuit including thick film resistors and thin film conductors and technique for fabrication thereof. 4,031,272, Cl. 427-96.000.
Khatti, Ramkishan; and Lourigan, Patrick M., to J. I. Case Company. Control valve for tractor-implement hydraulic system. 4,030,295, Cl. 60-445.000.
Khcheyan, Khachik Egorovich; Revenko, Olga Mikhailovna; Shatalova, Alla Nikolaevna; Gelperina, Eleonora Grigorievna; Agrinskaya, Lidia Ivanovna; and Muradian, Georgy Avanesovich. Method of preparing acrylonitrile. 4,031,128, Cl. 260-465.900.
Khoe, Giok Djan, to U.S. Philips Corporation. Method of coupling light conductors. 4,030,810, Cl. 350-96.00C.
Khoe, Giok Djan; Kuyt, Gerard; and Franken, Adrianus Jacobus Jozef, to U.S. Philips Corporation. Device for coupling a light source to an optical fiber. 4,030,811, Cl. 350-96.00C.
Khoma, Mikhail Ivanovich: *See—*
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.

Kibbel, William Henry, Jr.: *See—*
Goldstein, David; Kibbel, William Henry, Jr.; and Hollenbach, Roger C., 4,031,090.

Kidratschky, Hermann: *See—*
Wagner, Alfred; and Kidratschky, Hermann, 4,030,328.
Wagner, Alfred; and Kidratschky, Hermann, 4,030,334.

Kiener, Christian, to Tex International, S.A. Multiple loom. 4,030,526, Cl. 139-18.000.

Kieserling & Albrecht: *See—*
Koch, Rolf Eckart; and Fangmeier, Ralf, 4,030,332.

Kihara, Toshimasa, to Hitachi, Ltd. Addressing system in an information processor. 4,031,514, Cl. 364-200.000.

Kikuchi, Hideo: *See—*
Akimoto, Hidetoshi; Kaji, Ryuichi; Kikuchi, Hideo; Hishinuma, Yukio; and Arikawa, Yoshijiro, 4,031,185.

Kikuchi, Tadao, to Hitachi, Ltd. Three-state discernment circuit. 4,031,410, Cl. 307-209.000.

Kikuchi, Takehiro: *See—*
Isikawa, Tosio; Ozawa, Jun; and Kikuchi, Takehiro, 4,031,347.

Kim, Young Sul. Methampicillin lysinate and its method of manufacturing. 4,031,076, Cl. 260-239.100.

Kimberly-Clark Corporation: *See—*
Melnikov, Igor V., 4,030,629.

Kimmon Electric Co., Ltd.: *See—*
Tokudome, Katsumi; and Hattori, Shuzo, 4,031,428.

Kimura, Hiroyuki; and Saito, Takahiko, to Sony Corporation. Apparatus for magnetic recording and/or reproducing of signals received by one or more signal receiving devices. 4,031,334, Cl. 179-100.110.

Kimura, Katsuhiro: *See—*
Shinkawa, Keiro; Sodeyama, Chiuichi; Kaneko, Yoichi; and Kimura, Katsuhiro, 4,031,472.

King, Donald J.; Lura, Loren E.; and Maurushat, Ewalt, to General Motors Corporation. Gas bearing roll shell assembly with selective drive means. 4,030,784, Cl. 308-107.000.

King, Frederick N. Speed detection system for automobiles and other motor-driven objects. 4,031,510, Cl. 340-62.000.

King, Herbert Ray: *See—*
Brown, Robert Saul; Eschenbach, Paul W.; and King, Herbert Ray, 4,030,582.

Kinnucan, Walter Frederick, Jr. Longitudinal joint assembly in combination with a paving form. 4,030,693, Cl. 249-9.000.

Kinoshita, Hiroshi: *See—*
Kaneko, Takashi; Yuminaka, Takeo; Iwasaka, Tatsuo; and Kinoshita, Hiroshi, 4,030,571.

Kipping, Joachim: *See—*
Schmitt, Ludwig; and Kipping, Joachim, 4,030,165.

Kira, Heizo: *See—*
Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Aishita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, 4,030,977.

Kirose, Yutaka: *See—*
Yamamoto, Kenichi; Kirose, Yutaka; and Maeda, Tooru, 4,030,454.

Kise, Masahiro: *See—*
Murai, Hiromu; Kitaguchi, Koji; Suminokura, Tatsuo; Sano, Akira; Kise, Masahiro; Kitano, Masahiko; and Tomita, Toshio, 4,031,303.

Kistner, Hermann; and Lehmann, Gunthart, to Maschinenbau Oppenweiler GmbH. Device for cutting through a pile of sheets with a revolving blade. 4,030,394, Cl. 83-409.000.

Kita, Shinichiro: *See—*
Shirayama, Kenzo; Kita, Shinichiro; and Fujimoto, Masanori, 4,031,062.

Kitada, Masaya: *See—*
Akae, Kiyoshi; Kitada, Masaya; and Uno, Yoshiyuki, 4,030,876.

Kitagawa, Norishisa: *See—*
Redwine, Donald J.; and Kitagawa, Norishisa, 4,031,415.

Kitaguchi, Koji: *See—*
Murai, Hiromu; Kitaguchi, Koji; Suminokura, Tatsuo; Sano, Akira; Kise, Masahiro; Kitano, Masahiko; and Tomita, Toshio, 4,031,303.

Kitano, Masahiko: *See—*
Murai, Hiromu; Kitaguchi, Koji; Suminokura, Tatsuo; Sano, Akira; Kise, Masahiro; Kitano, Masahiko; and Tomita, Toshio, 4,031,303.

Kiwior, Alexander Michael, to Bendix Corporation, The. Electromagnetically operated fuel injection valve. 4,030,668, Cl. 239-585.000.

Kiyota, Yuhiko: *See—*
Nakagami, Tatsuro; and Kiyota, Yuhiko, 4,030,465.

Klebansky, Alexandr Leibovich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.

Klein, Gerald Lee; and Meyer, Richard C., to Beckman Instruments, Inc. Fluorometer. 4,031,399, Cl. 250-461.00B.

Klein, Rolf: *See—*
Guggi, Diether Josef; and Klein, Rolf, 4,030,615.

Kleinschmit, Einhard; Tattermusch, Peter; and Haverbeck, Gunther, to Daimler-Benz Aktiengesellschaft. Connecting element for wheel suspensions of motor vehicles. 4,030,714, Cl. 267-21.00A.

Kling, Gunter: *See—*
Meixner, Rudolf; and Kling, Gunter, 4,030,773.

Klink, Otto W.: *See—*
Snyder, Robert O.; and Klink, Otto W., 4,030,596.

Klochko, Viktor Alexandrovich: *See—*
Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich, 4,030,339.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Kunath, Paul, 4,030,878.

Klockner-Werke AG: *See—*
Chitil, Manfred; and Hubatsch, Gotthard, 4,031,309.

Klosky, John Patrick: *See—*
Holloran, Thomas Patrick; Braden, Arthur Buell; Foley, Jerrold Stokes; Maynard, James Lucian; Klosky, John Patrick; Dissauer, Gerald Anthony; Adams, Terrence Miller; and Lorenz, Allan Alfred, 4,031,518.

Kluge, Reimund: *See—*
Muller, Gunter; and Kluge, Reimund, 4,030,602.

Knipp, Ulrich: *See—*
Boden, Heinrich; and Knipp, Ulrich, 4,030,637.

Kniss, Edward L., Jr.; Hixenbaugh, Dennis L.; Maudlin, Jerry A.; and Brozenick, Nicholas J., to American Air Filter Company, Inc. Expansion joint. 4,030,740, Cl. 285-16.000.

Knoll A.G. Chemische Fabriken: *See—*
Cyrus, Richard; and Raschack, Manfred, 4,031,216.

Knoll, Frank S.: *See—*
Sommer, Edward J., Jr.; Kenny, Garry R.; Knoll, Frank S.; and Mitchell, David W., 4,031,004.

Kobayashi, Tadashi. Apparatus for simultaneous defiberization of waste paper stock and uniform dispersion and accumulation of the defiberized fine fiber stock for dry web formation. 4,030,865, Cl. 425-82.000.

Kobayashi, Takashi: *See—*
Taneda, Yukinori; and Kobayashi, Takashi, 4,030,614.

Kobayashi, Tsutomu: *See—*
Fujiwara, Hideo; Ichinose, Yukio; Taniguchi, Satoshi; Kobayashi, Tsutomu; Ichino, Kazuo; Itoh, Michiyasu; Uesaka, Yasutaro; Inose, Fumiyuki; and Ueno, Sadayasu, 4,031,496.

Kobinger, Walter: *See—*
Kutter, Eberhard; Austel, Volkhard; Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; Lillie, Christian; and Kadatz, Rudolf, 4,031,219.

Kobzina, John W., to Chevron Research Company. Herbicidal N-haloacetyl-1,2-dihydro-4H-3,1-benzoxazine. 4,030,906, Cl. 71-66.000.

Koch, Claude V., to AMF Incorporated. Modular time sequence controller. 4,031,339, Cl. 200-38.0BA.

Koch, Frederick William: *See—*
Musser, Jerry Lee; and Koch, Frederick William, 4,031,023.

Koch, Rolf Eckart; and Fangmeier, Ralf, to Kieserling & Albrecht. Machine for straightening elongated workpieces. 4,030,332, Cl. 72-164.000.

Kochemidov, Atanas Dimitrov; Makedonski, Boris Georgiev; Dumanov, Ivan Minkov; Payakov, Stefan Georgiev; Galabov, Peter Konstantinov; and Atanassov, Haralampi Aangelov, to Zniitmash. Automatic machine for magnetic abrasive polishing of internal rotational surfaces. 4,030,249, Cl. 51-105.00R.

Koegel, Wolfram: *See—*
Tatzel, Hermann; Koegel, Wolfram; Beck, Gilbert; Zuern, Ludwig; and Caesar, Arndt Christian, 4,031,179.

Koehler, Peggy Joe: *See—*
York, Alvin, 4,030,654.

Koehnen, Edward L. Loader attachment for handling logs, bales and the like. 4,030,625, Cl. 214-147.00G.

Koepke, Barry G.: *See—*
Bernal G., Enrique; Koepke, Barry G.; and Maciolek, Ralph B., 4,031,190.

Kohan Sendan Kikai Kabushiki Kaisha: *See—*
Nagata, Toshio; Kawasaki, Kunijiro; Takahama, Ryuichiro; Miyatani, Yoshifusa; and Funakoshi, Sozo, 4,030,441.

Kohashi, Tadao; and Kurosawa, Toshiharu, to Matsushita Electric Industrial Co., Ltd. Control element having liquid layer attainable to geometrically uneven state in response to electrical signal. 4,030,813, Cl. 350-161.00S.

Kohler, Gunter A., to Minnesota Mining and Manufacturing Company. Process for forming carbonaceous fibers. 4,031,188, Cl. 423-447.600.

Kohout, Otto James: *See—*
Giles, Thomas Clyde; Kohout, Otto James; and Rinaldi, Gerald Michael, 4,031,414.

Koiwa, Seki; and Hasegawa, Hajime. Hair cutter. 4,030,196, Cl. 30-133.000.

Kojima, Kojiro; Sakurai, Yoshihisa; Sugai, Tetuya; and Motegi, Masayoshi, to Nippon Steel Corporation. Method and apparatus for automatically measuring distribution of reflectance of coals. 4,030,837, Cl. 356-209.000.

Kokado, Naoyuki; and Makino, Shinichi, to Tokyo Shibaura Electric Co., Ltd. Operation program-presetting system. 4,031,470, Cl. 325-396.000.

Kokubu, Yoshikazu: *See—*
Nakamura, Tadashi; Hagiwara, Hisami; and Kokubu, Yoshikazu, 4,031,000.

Kollmar, Carl E., Jr.: *See—*
Kunkle, Albert C.; and Kollmar, Carl E., Jr., 4,030,941.

Kollonitsch, Janos, to Merck & Co., Inc. Substitutive fluorination of organic compounds. 4,030,994, Cl. 204-159.110.

Kolokolov, Boris Alexeevich: *See*—
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Komnatny, Igor Pavlovich: *See*—
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Kondo, Toshihiro, to Kondo, Toshihiro; and Fuji Photo Film Co., Ltd. Spring drum. 4,030,567, Cl. 185-37.000.

Kondratenko, Anatoly Borisovich: *See*—
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.

Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, to Bayer Aktiengesellschaft. Penicillins and processes for their preparation and use. 4,031,229, Cl. 424-271.000.

Konishi, Toji, to Eisai Co., Ltd. Method for treating nervous bladder. 4,031,205, Cl. 424-94.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Akira, Kato; Akira, Itoh; Tohru, Uchida; and Masao, Ishihara, 4,030,921.

Konomi, Toshiaki: *See*—
Yamaguchi, Shunzo; Ozaki, Tadashi; and Konomi, Toshiaki, 4,030,464.

Kononenko, Vadim Grigorievich: *See*—
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Konstance, Richard P.: *See*—
Sullivan, John F.; Konstance, Richard P.; and Heiland, Wolfgang K., 4,031,252.

Konstant, Anthony N., to Speedrack Inc. Adjustable storage racks. 4,030,611, Cl. 211-191.000.

Kooch, Walter: *See*—
Dupont, John A.; Kooch, Walter; and Scott, Joseph D., 4,031,055.

Koppe, Herbert; Zeile, Karl; Kummer, Werner; Stahle, Helmut; and Danneberg, Peter, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing a 1-(2,6-dimethyl-phenoxy)-2-aminoalkane and method of use. 4,031,244, Cl. 424-330.000.

Kornfeld, Edmund C.: *See*—
Bach, Nicholas J.; Hall, David A.; and Kornfeld, Edmund C., 4,031,097.

Kortenbach & Rauh Kommanditgesellschaft: *See*—
Schultes, Tilmann, 4,030,514.

Koshar, Robert J., to Minnesota Mining and Manufacturing Company. Use of bis(fluoroaliphaticsulfonyl) imides in cationic polymerization. 4,031,036, Cl. 260-2.00N.

Kotchen, Deborah L. Frame for textiles, needlework and the like. 4,030,220, Cl. 40-156.000.

Kotelnikov, Vladimir Ivanovich: *See*—
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Kotter, James I.: *See*—
Folk, Craig L.; and Kotter, James I., 4,030,280.

Kouda, Michihiro: *See*—
Ogawa, Yoshihisa; Inazaki, Tsunenori; and Kouda, Michihiro, 4,031,194.

Kouwenhoven, Adriaan P.: *See*—
Lukas, Joachim H.; Baardman, Frank; and Kouwenhoven, Adriaan P., 4,031,152.

Koyama, Masaya, to Goldwell GmbH. Apparatus for foaming liquid cosmetic substances. 4,030,665, Cl. 239-373.000.

Kozlowski, Matthew A.: *See*—
Pines, Seemon H.; and Kozlowski, Matthew A., 4,031,085.

Krabetz, Richard: *See*—
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Lebert, Ulrich; and Thiessen, Fritz, 4,031,135.

Krafft, Werner: *See*—
Stahlke, Kurt-Rainer; Krafft, Werner; Meyer, Rudolf; and Rosenkranz, Hans Jurgen, 4,030,926.

Krahe, Eduard: *See*—
Bronstert, Klaus; Fahrbach, Gerhard; Krahe, Eduard; Ladenberger, Volker; Kastning, Ernst-Guenther; Mittnacht, Hans; Willersinn, Herbert; and Trieschmann, Hans-Georg, 4,031,166.

Krammer, Robert, to Standard Conveyor Company. Material handling system. 4,030,423, Cl. 104-172.00S.

Kraus, Edmund J.: *See*—
Kraus, Robert A.; and Kraus, Edmund J., 4,030,303.

Kraus, Robert A.; and Kraus, Edmund J. Waste heat regenerating system. 4,030,303, Cl. 60-688.000.

Krause, Donald Lester; and Presley, Kenneth Dale, to International Business Machines Corporation. Mixture of binder materials for use in connection with a charge transport layer in a photoconductor. 4,030,923, Cl. 96-1.500.

Krause, Ernest Harry; Seaman, Wesley Arthur; and Angelopoulos, Peter Gregory, to Pioneer Electric and Research Corporation, The. Digital photo-optical tachometer. 4,031,466, Cl. 324-175.000.

Krauss, Helmut: *See*—
Moeller, Jurgen; Mitrach, Werner; Krauss, Helmut; and Schulte, Hubert, 4,031,459.

Kress, Dieter, to Mapal Dr. Kress KG. Reaming tool. 4,030,855, Cl. 408-226.000.

Krezanoski, Joseph Zenon, to Flow Pharmaceuticals, Inc. Aqueous solution suitable for dissipating available iodine contained in an iodophor. 4,031,209, Cl. 424-150.000.

Kroesser, Edward James, to United Technologies Corporation. Redundant pushrod-to-bellcrank connection. 4,030,378, Cl. 74-469.000.

Kroll, Charles Thomas: *See*—
Keenan, William Andrew; and Kroll, Charles Thomas, 4,030,942.

Kron, Gerald J., to Singer Company, The. G-seat with skin tension cue generator. 4,030,207, Cl. 35-12.00E.

Kroupa, Kenneth M.: *See*—
Hornig, Carl F.; Kroupa, Kenneth M.; and Simpson, Earle E., 4,030,966.

Kruklitis, Karlis: *See*—
Christou, Kyriakos; Kruklitis, Karlis; and Burger, William R., 4,031,359.

Krunchak, Vladimir Georgievich: *See*—
Shults, Mikhail Mikhailovich; Parfenov, Anatoly Ivanovich; Shnypikov, Alexandr Dmitrievich; Krunchak, Vladimir Georgievich; Evnina, Sarra Borisovna; Dolidze, Vladimir Alexandrovich; and Tarasova, Valentina Mikhailovna, 4,030,935.

Kryschuk, John J.: *See*—
Sanders, James Milton; Taylor, William I.; Hill, Ira D.; and Kryschuk, John J., 4,031,161.

Kubik Hydradrives, Inc.: *See*—
Poppelreiter, Joseph C., II, 4,031,442.

Kubinek, Milan: *See*—
Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, 4,030,944.

Kuchenmeister, Rolf: *See*—
Dhein, Rolf; Zabrocki, Karl; Beer, Wolfgang; and Kuchenmeister, Rolf, 4,031,047.
Dhein, Rolf; Schoeps, Jochen; and Kuchenmeister, Rolf, 4,031,052.

Kudelka, Herbert: *See*—
Piret, Norbert L.; Rabben, Hans Joachim; Kudelka, Herbert; and Schmidt, Siegbert, 4,030,990.

Kudlacik, Henry W.: *See*—
Armor, Anthony F.; Chari, Madabushi V. K.; Kudlacik, Henry W.; and Reece, Paul, 4,031,422.

Kugisawa, Toshio, to Kabushiki Kaisha Kawai Gakki Seisakusho. Musical-tone signal forming apparatus for an electronic musical instrument. 4,030,395, Cl. 84-1.030.

Kuh, Arthur David; and Condit, Paul Brainard, to Eastman Kodak Company. Processing compositions containing glycols for color transfer processes comprising direct positive silver halide developement. 4,030,920, Cl. 96-29.00D.

Kuhn, Rolf; Hardebeck, Klaus; and Heinemann, Helmut, to Boehringer Mannheim G.m.b.H. Pharmaceutical composition and method for the treatment of hydropic conditions. 4,031,213, Cl. 424-229.000.

Kukolja, Stjepan; and Spry, Douglas O., to Eli Lilly and Company. Process for cephalosporin antibiotic intermediates. 4,031,084, Cl. 260-243.00C.

Kummer, Werner: *See*—
Koppe, Herbert; Zeile, Karl; Kummer, Werner; Stahle, Helmut; and Danneberg, Peter, 4,031,244.

Kuna, Wayne A.: *See*—
Terzian, Rouben T.; Schoenfield, Palmer J.; Dunn, Kathy A.; and Kuna, Wayne A., 4,030,235.

Kunath, Paul, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and apparatus for the connection of a rotary drum drive of a rotary furnace. 4,030,878, Cl. 432-45.000.

Kunkle, Albert C.; and Kollmar, Carl E., Jr., to J. M. Huber Corpora-

tion. Method for reducing the viscosity and for refining kaolin clays. 4,030,941, Cl. 106-309.000.
Kurata, Shigenori: *See—*
Sugiura, Kensuke; Kagaya, Mineo; Fujisou, Tokuo; Aoki, Hiroyuki; Takehara, Takeichiro; and Kurata, Shigenori, 4,031,020.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Nakamura, Tadashi; Hagiwara, Hisami; and Kokubu, Yoshikazu, 4,031,000.
Kurkov, Victor P., to Chevron Research Company. Alpha, beta-butenolide preparation. 4,031,114, Cl. 260-343.600.
Kurkov, Victor P., to Chevron Research Company. 4-Pentenoic acid conversion. 4,031,115, Cl. 260-343.600.
Kurosaki, Takefumi, to Rank Xerox Ltd. Automatic manuscript discharging device for copying machines. 4,030,721, Cl. 271-3.000.
Kurosawa, Toshiaki: *See—*
Sakai, Yoshio; and Kurosawa, Toshiaki, 4,031,439.
Kurosawa, Toshiharu: *See—*
Kohashi, Tadao; and Kurosawa, Toshiharu, 4,030,813.
Kusaka, Satoru, to Sony Corporation. Head drum assembly with electrical noise shield. 4,031,558, Cl. 360-130.000.
Kuska, Walter J.; and McGowan, Edward J., Jr., to Stoelting Company. Non-invasive blood pressure monitor. 4,030,484, Cl. 128-2.05R.
Kutin, Alexandr Nikolaevich: *See—*
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.
Kutter, Eberhard; Austel, Volkhard; Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; Lillie, Christian; and Kadatz, Rudolf, to Boehringer Ingelheim GmbH. Bis-homophthalimides and salts thereof. 4,031,219, Cl. 424-258.000.
Kuykendall, Charles N.: *See—*
Hammel, Ronald O.; Kuykendall, Charles N.; and Fischer, William A., 4,031,450.
Kuyt, Gerard: *See—*
Khoe, Giok Djan; Kuyt, Gerard; and Franken, Adrianus Jacobus Jozef, 4,030,811.
Kuzel, Frank J.: *See—*
Swanson, Kermit E.; and Kuzel, Frank J., 4,030,621.
Kyncl, Jaroslav: *See—*
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,031,242.
Kyselica, Stanislav: *See—*
Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, 4,030,944.
Labie, Allan S.; Thornton, Charles; Lew, Irwin Paul; and Gutman, Abraham, to International Environmental Dynamics. Folded slab floor construction and method. 4,030,257, Cl. 52-126.000.
Laboratoires Jacques Logeais: *See—*
Maillard, Jacques Georges, 4,031,133.
Laboratorios del Dr. Esteve S.A.: *See—*
Esteve-Subirana, Antonio, 4,031,240.
Laboratorios Hermes, S.A.: *See—*
Chimeno, Jose-Alfonso Canicio, 4,031,105.
Lace, Melvin Arthur, to Motorola, Inc. Synchronous rotor indexing mechanism. 4,030,466, Cl. 123-146.50A.
Lacombe, Gaetan Y., to D.C. Glass Ltd. Protective capping channel for glass sealed unit. 4,030,263, Cl. 52-616.000.
Ladenberger, Volker: *See—*
Bronstert, Klaus; Fahrbach, Gerhard; Krahe, Eduard; Ladenberger, Volker; Kastning, Ernst-Guenther; Mittnacht, Hans; Willersinn, Herbert; and Trieschmann, Hans-Georg, 4,031,166.
Laidlaw Corporation: *See—*
Barnes, Tracy W., 4,031,270.
Lake Aid Inc.: *See—*
Henegar, Dale L., 4,030,859.
Lake St. Louis Research Products, Inc.: *See—*
Navato, Jose Miguel Antonio Rosario, 4,030,482.
Lakin, Willis M. Rotating toys, particularly flying toys. 4,030,238, Cl. 46-86.00R.
Lakomy, Dale G.: *See—*
Bauer, Martin L.; Johnson, Wayne F.; and Lakomy, Dale G., 4,030,834.
Lalin, Andre; and Piret, Jean, to Regie Nationale des Usines Renault. Hydraulic control device for automatic change-speed transmissions. 4,030,381, Cl. 74-867.000.
Lambertz, Martin R.; and Fiorelli, Maria, to Stanley Works, The. Corner bracket and roller assembly for sliding doors. 4,030,160, Cl. 16-105.000.
Lamm, August Uno. Rotary piston engine. 4,030,458, Cl. 123-44.00D.
Lamparter, Hansruedi: *See—*
Hablutzel, Kurt; and Lamparter, Hansruedi, 4,030,635.
Lampietti, Bernard P.: *See—*
Collins, Charles P.; and Lampietti, Bernard P., 4,030,327.
Lampman, Duncan L., to Diagraph-Bradley Industries, Inc. Stencil cutting apparatus. 4,030,592, Cl. 197-6.400.
Lance, Richard T.: *See—*
Papafingos, Pandelis N.; and Lance, Richard T., 4,030,914.
Landis Tool Company: *See—*
Price, Ralph E., 4,030,252.
Landyshev, Vladimir Vladislavovich: *See—*
Grigorenko, Anatoly Sergeevich; Moroz, Jury Antonovich; and Landyshev, Vladimir Vladislavovich, 4,030,336.
Langenbach, Jack E., to International Telephone and Telegraph Corporation. Electrical contact and retention means therefor. 4,030,803, Cl. 339-217.00S.
Langer, Alois A.: *See—*
Heilman, Marlin S.; Langer, Alois A.; Mirowski, Mieczyslaw; Mower, Morton M.; and Reilly, David M., 4,030,509.
Langowski, Faustyn Cornell, to BJ-Hughes Inc. Pipe handling head. 4,030,746, Cl. 294-88.000.
Lanno, Joseph P. Fluid dispenser system. 4,030,638, Cl. 222-180.000.
Lapetina, Robert Anthony, to Edo Western Corporation. Sonar/television system for use in underwater exploration. 4,031,544, Cl. 358-99.000.
Larionova, Julia Alexeevna: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.
Lark S.p.A.: *See—*
Palladino, Gaetano, 4,031,080.
Larsen, Ole Fjord. Apparatus for preventing erosion of the seabed in front of hydraulic structures. 4,030,306, Cl. 61-3.000.
Larson, Raymond L.: *See—*
Dombrowski, Frank R.; and Larson, Raymond L., 4,030,184.
Larsson, Erik. Helical gear pump and method of manufacturing the same. 4,030,862, Cl. 418-48.000.
Lasswell, Tull C.; and Monier, John L. Method of coating metal with vinylidene chloride-vinyl chloride copolymer. 4,031,277, Cl. 427-388.00R.
Lattin, Kenneth R., to United States of America, Energy Research and Development Administration. Method of determining whether radioactive contaminants are inside or outside a structure. 4,031,387, Cl. 250-252.000.
Laughlin, Robert Gene; and Gougeon, Thomas William, to Procter & Gamble Company, The. Controlled release contraceptive article. 4,031,202, Cl. 424-28.000.
Laughter, Clifford M., to General Electric Company. Luminaire assembly. 4,031,382, Cl. 240-25.000.
Lawrence Peska Associates, Inc.: *See—*
Everman, Don D., 4,030,867.
Lawton, Robert A.; and Andrews, James R., to United States of America, Air Force. Waveform sampler. 4,030,840, Cl. 356-256.000.
Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique. Method of making magnetic head devices. 4,030,189, Cl. 29-603.000.
Lea, Paul M., III, to Amsted Industries Incorporated. Continuous method of and apparatus for making bars from powdered metal. 4,030,919, Cl. 75-214.000.
Leader, Victor. Rotary cutting and bagging machine. 4,030,273, Cl. 56-13.400.
Lebert, Ulrich: *See—*
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Lebert, Ulrich; and Thiessen, Fritz, 4,031,135.
LeBlanc, Joseph David: *See—*
St. Andre, Arthur Francis; LeBlanc, Joseph David; and Robillard, Edward George, 4,031,446.
Le Comte, Michel L., to Jeumont-Schneider. Method and apparatus for fast multiplication including conversion of operand format. 4,031,378, Cl. 235-164.000.
Lee, Don H.; Weller, Kenneth P.; and Thrower, William F., to Hughes Aircraft Company. Planar process for making high frequency ion implanted passivated semiconductor devices and microwave integrated circuits. 4,030,943, Cl. 148-1.500.
Lee, Ming H.: *See—*
Hirosawa, Frank N.; and Lee, Ming H., 4,031,049.
Leedom, Marvin Allan, to RCA Corporation. Disc player and stylus therefor. 4,031,546, Cl. 358-128.000.
Lefaudeux, Francois L. M.; and Quivy, Michel Georges, to Etat Francais. Hydrophone with acoustic reflector. 4,031,502, Cl. 340-10.000.
Le Goascoz, Vincent: *See—*
Audaire, Luc; Borel, Joseph; Le Goascoz, Vincent; and Poujois, Robert, 4,031,380.
Le Guillou, Felix Francois, to Etablissements Valois S.A. Push-button having a calibrated outlet for a container under pressure. 4,030,667, Cl. 239-573.000.
Lehmann, Gunthart: *See—*
Kistner, Hermann; and Lehmann, Gunthart, 4,030,394.
Leighton, Peter Watson; and Davidson, Charles Patrick Duncan, to Lucas Industries Limited. Motor and pedal propeller cycle. 4,030,562, Cl. 180-34.000.
Leland Stanford Junior University, The Board of Trustees of: *See—*
Bond, Walter L.; Cutler, Cassius C.; and Lemons, Ross A., 4,030,342.
LeMay, Christopher Archibald Gordon, to EMI Limited. Radiography. 4,031,395, Cl. 250-360.000.
Lemons, Ross A.: *See—*
Bond, Walter L.; Cutler, Cassius C.; and Lemons, Ross A., 4,030,342.

Lench, Jack; and Ferrari, Luigi M., to Del Laboratories, Inc. Roll-on dispenser bottle assembly. 4,030,844, Cl. 401-213.000.

Lennon, David C.; and Wandler, Richard A., to General Electric Company. Terminal block assembly and multiple connector assembly therefor. 4,030,802, Cl. 339-192.00R.

Lentz, William P. TV bulb funnel construction. 4,030,627, Cl. 220-2.10A.

Lenz, Gunter: *See—*
Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; Henning, Klaus; and Kandler, Joachim, 4,031,022.

Leonard, Hamlin, to B-5 Associates of Stamford, Connecticut. Variable speed drive for a bicycle. 4,030,373, Cl. 74-230.190.

Leonard, John J., to Atlantic Richfield Company. Preparing aqueous alkaline slurry of thallic oxide. 4,031,196, Cl. 423-624.000.

Leoncavallo, Richard Anthony: *See—*
White, Peter Charles; Benson, John Terry; and Leoncavallo, Richard Anthony, 4,030,239.

Leone, Ronald E.; Weber, Wayne W., II; and Wrathall, Donald P., to Eastman Kodak Company. Photographic compositions and elements including internal latent image silver halide grains and acylhydrazinophenylthiourea nucleating agents therefor. 4,030,925, Cl. 96-73.000.

Leone, Ronald E.; Weber, Wayne W., II; and Wrathall, Donald P., to Eastman Kodak Company. Acyl hydrazino thiourea derivatives as photographic nucleating agents. 4,031,127, Cl. 260-465.00D.

Leonik, Stephen A., Jr. Multi-channel temperature responsive process control system. 4,031,355, Cl. 219-502.000.

Letot, Incorporated: *See—*
Churchill, Steven T., 4,031,322.

Leuschner, Horst: *See—*
Ehni, George John, III; and Leuschner, Horst, 4,031,474.

Levin, Nathan. Yarn tensioning device. 4,030,684, Cl. 242-152.100.

Lew, Irwin Paul: *See—*
Labie, Allan S.; Thornton, Charles; Lew, Irwin Paul; and Gutman, Abraham, 4,030,257.

Lewis, Nathanial H. Spinning balloon novelty. 4,030,237, Cl. 46-53.000.

Leyde, Warren L.; and Marker, Delbert E., to Pacific Technology, Inc. Method and apparatus for controlling electrical loads. 4,031,406, Cl. 307-41.000.

Lezotte, Tim F.: *See—*
Kantz, Don B.; and Lezotte, Tim F., 4,030,297.

Lie, Bjorn: *See—*
Dorph, Thor, 4,030,224.

Lie, Gina: *See—*
Dorph, Thor, 4,030,224.

Liebetrau, Richard E.; and Miller, Larry J., to Swiss Aluminium Ltd. Storage and display apparatus employing cantilevered roller track. 4,030,609, Cl. 211-162.000.

Liebl, Helmut: *See—*
Buzzi, Leo; Buzzi, Valentin; Opietnik, Walter; Liebl, Helmut; and Malobabic, Peter, 4,030,573.

Lillie, Christian: *See—*
Kutter, Eberhard; Austel, Volkhard; Eberlein, Wolfgang; Heider, Joachim; Kobinger, Walter; Lillie, Christian; and Kadatz, Rudolf, 4,031,219.

Linck, Donald W., II; and Kaprelian, George, to Linck, Donald W., II; Kaprelian, George; Basta, Tom; Corbett, Maury; Danzig, William; Hunt, Gary; Ingram, Arthur; McNeill, Charles; Preiner, Gerald; and Roth, Ronald. Base plates for dental articulators. 4,030,197, Cl. 32-32.000.

Linde Aktiengesellschaft: *See—*
Wimber, Hans; Rohde, Wilhelm; and Reyhing, Jorg, 4,030,896.

Linder, Jean: *See—*
Schopper, Alf; and Linder, Jean, 4,030,281.

Lingaraju, Bhartoor: *See—*
Vidoni, John; Lingaraju, Bhartoor; and Timmins, John C., 4,030,800.

Liniger, Andreas M.: *See—*
Liniger, Max, 4,030,916.

Liniger, Max, to Liniger, Andreas M. Process for recovering lead from the active material of used batteries. 4,030,916, Cl. 75-77.000.

Lion Fat & Oil Co., Ltd.: *See—*
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; Taniyasu, Ryozo; and Nagayama, Masuzo, 4,031,158.
Mandai, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; and Sato, Michito, 4,031,159.

Lipovac, Stanislava N., to Westvaco Corporation. Universal fountain solution for lithographic offset printing. 4,030,417, Cl. 101-451.000.

Lisiecke, Hieronim L.: *See—*
Scholin, Harold W.; and Lisiecke, Hieronim L., 4,030,385.

Litman, Alan, to Smith & Wesson Chemical Company, Inc. Dual purpose projectile and weapon combination. 4,030,421, Cl. 102-92.300.

Litre Meter Limited: *See—*
Wemyss, William Alexander, 4,030,357.

Little, Norman: *See—*
Kefauver, Bernard C.; and Little, Norman, 4,030,271.

Litton Business Systems, Inc.: *See—*
Antonio, Christo; and Uhl, Wyman F., 4,030,955.

Liu, Richard Tien-Szu: *See—*
Margolis, Geoffrey; Rushmore, Dean Frederick; and Liu, Richard Tien-Szu, 4,031,251.

Liuzzo, Giuseppe: *See—*
Barba, Diego; Germana, Antonino; Liuzzo, Giuseppe; and Tagliaferri, Giovanni, 4,030,985.

Livesay, Richard E.: *See—*
Cobb, Delwin E.; Jackson, George J.; Livesay, Richard E.; and Stemler, Orrin A., 4,030,566.

Loch, Emil P., to Westinghouse Electric Corporation. Insert for explosively expanding a tube into engagement with a tube sheet. 4,030,419, Cl. 102-24.00R.

Loesch, Claude E.: *See—*
Loesch, Leo J.; and Loesch, Claude E., 4,030,223.

Loesch, Leo J.; and Loesch, Claude E. Fish line control apparatus with magnetic release. 4,030,223, Cl. 43-15.000.

Loest, Kent W., to Southwire Company; National Steel Corporation; and Earth Sciences, Inc., part interest to each. Recovery of aluminum from alunite ore using acid leach to purify the residue for bayer leach. 4,031,182, Cl. 423-127.000.

Logan, Robert Thomas: *See—*
Woods, Gilbert Frederick; Logan, Robert Thomas; McGarry, George; and Roy, Robert Gibson, 4,031,075.

Loge, Olaf: *See—*
Ahrens, Hanns; Biere, Helmut; Rufer, Clemens; Schmiechen, Ralph; Schroeder, Eberhard; Loge, Olaf; Losert, Wolfgang; and Schillinger, Ekkehard, 4,031,236.

Lohbauer, Kenneth R.: *See—*
Bridwell, John W.; Hopkins, Donald L.; and Lohbauer, Kenneth R., 4,030,623.

Loikitz, Frank F., to Buildex Incorporated. Self-closing spring hinges. 4,030,161, Cl. 16-186.000.

Long, John V.: *See—*
Cremer, George D.; and Long, John V., 4,031,279.

Longa, Pier Luigi; and Gamba, Piero, to Ing. C. Olivetti & C., S.p.A. Stabilized power supply. 4,031,452, Cl. 321-2.000.

Longly, James M.: *See—*
Ziebell, Donald O.; and Longly, James M., 4,031,468.

Lord Corporation: *See—*
Gervase, Nicholas J., 4,031,120.

Lorenz, Allan Alfred: *See—*
Holloran, Thomas Patrick; Braden, Arthur Buell; Foley, Jerrold Stokes; Maynard, James Lucian; Klosky, John Patrick; Dissauer, Gerald Anthony; Adams, Terrence Miller; and Lorenz, Allan Alfred, 4,031,518.

Losel, Walter; Traunecker, Werner; and Hoefke, Wolfgang, to Boehringer Ingelheim GmbH. 3β-(4-Oxo-α-L-rhamnosyl)-β-hydroxy-bufa-4,20,22-trienolide. 4,031,212, Cl. 424-182.000.

Losert, Wolfgang: *See—*
Ahrens, Hanns; Biere, Helmut; Rufer, Clemens; Schmiechen, Ralph; Schroeder, Eberhard; Loge, Olaf; Losert, Wolfgang; and Schillinger, Ekkehard, 4,031,236.

Lostia, Onofrio; and Bartoli, Francesco, to Snam Progetti S.p.A. Fibres incorporating antibodies, antigens and antisera, method for their preparation and their use. 4,031,201, Cl. 424-27.000.

Loundagin, James A.: *See—*
Cram, Robert E.; Gill, Walter; and Loundagin, James A., 4,030,523.

Lourigan, Patrick M.: *See—*
Khatti, Ramkishan; and Lourigan, Patrick M., 4,030,295.

Lovercheck, Charles L.: *See—*
Brugger, Richard D.; and Lovercheck, Charles L., 4,030,823.

Lowery, Robert D.; and Mehrbrodt, Alphonso W., to Marquette Metal Products Company. Normally disengaged electro-magnetic spring clutch capable of field adjustment of the wrap angle. 4,030,584, Cl. 192-84.00T.

Lozinsky, Miron Onufrievich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.

Lubrizol Corporation, The: *See—*
Miller, Clark Ober, 4,031,015.
Miller, Clark Ober, 4,031,118.
Musser, Jerry Lee; and Koch, Frederick William, 4,031,023.

Lucas Electrical Company Limited, The: *See—*
Hill, William Frank, 4,031,403.

Lucas Industries Limited: *See—*
Glaze, Stanley George, 4,030,580.
Leighton, Peter Watson; and Davidson, Charles Patrick Duncan, 4,030,562.

Luce, Robert L.; Perry, Joseph P.; and Sansburry, James D., to Fairchild Camera and Instrument Corporation. Method of MOS circuit fabrication. 4,030,952, Cl. 148-187.000.

Lucia, Emmanuel A.: *See—*
Vinansky, George, Jr.; and Lucia, Emmanuel A., 4,031,301.

Luebkemann, Leroy, to Fiat-Allis Construction Machinery, Inc. Method of manufacturing track roller with open cell plastic foam in lubrication cavity. 4,030,178, Cl. 29-149.5NM.

Lugash, Max J. Steerable wheeled garment bag. 4,030,768, Cl. 280-47.170.

Lugay, Joaquin Castro; and Feldman, Jacob Richard, to General Foods Corporation. Process of preparing nutritive sweetening compositions. 4,031,259, Cl. 426-548.000.

Lugay, Joaquin Castro: *See—*
Haas, Gerhard Julius; Herman, Edwin Bernard; and Lugay, Joaquin Castro, 4,031,250.

Lukas, Joachim H.; Baardman, Frank; and Kouwenhoven, Adriaan P.,

to Shell Oil Company. Preparation of derivatives of cyclobutane and cyclobutene. 4,031,152, Cl. 260-666.00A.
Lund, Svend Aage; Northeved, Allan; Solfjeld, Poul; and Fabrin, Knud Christian Claus, to Akademiet for de tekniske Videnskaber, Svejsecentralen. Apparatus for providing an ultrasonic sectional view stating the proportion of meat and lard in biological material. 4,030,343, Cl. 73-67.80S.
Lundgren, Carl William, Jr., to Bell Telephone Laboratories, Incorporated. Antenna with echo cancelling elements. 4,031,538, Cl. 343-781.0CA.
Lungu, Onut Antoniu: *See—*
Stanasila, Virgil Corneliu; Florica, Mihai; and Lungu, Onut Antoniu, 4,030,879.
Luperti, Harry E.: *See—*
Irvine, Robert; and Luperti, Harry E., 4,030,722.
Irvine, Robert; and Luperti, Harry E., 4,030,723.
Lura, Loren E.: *See—*
King, Donald J.; Lura, Loren E.; and Maurushat, Ewalt, 4,030,784.
Lurie, Michael Jay: *See—*
Andrevski, Zygmunt M.; and Lurie, Michael Jay, 4,030,815.
Luzzi, John J.: *See—*
Ramey, Chester E.; and Luzzi, John J., 4,031,095.
Lyle Development, Inc.: *See—*
Oberloier, John W., 4,030,650.
Lyons, Joseph. Trav-L-safe. 4,030,426, Cl. 109-51.000.
M.A. Buckley (Engraving) Limited: *See—*
Fellows, Stanley, 4,030,415.
M & W Gear Company: *See—*
Meiners, Elmo R., 4,030,753.
M^{a} : *See—*
Aparicio, Luis; Gayo, Nenesio; M^{a} ; Martin, Jose Luis; and Ron, Armando, 4,031,243.
Maass, Jurgen: *See—*
Nieschulz, Otto; Rudiger, Gunther; and Maass, Jurgen, 4,031,199.
Macchi, Giorgio: *See—*
Barba, Diego; Battistoni, Fabrizio; D'Agostini, Candido; and Macchi, Giorgio, 4,031,187.
Maciolek, Ralph B.: *See—*
Bernal G., Enrique; Koepke, Barry G.; and Maciolek, Ralph B., 4,031,190.
Mackey, James R.: *See—*
Meisner, Merlin M.; Matulis, Raymond M.; and Mackey, James R., 4,030,959.
Macklin, Bernard: *See—*
Coleman, Allan; and Macklin, Bernard, 4,031,312.
MacMillan, Kenneth T. Venting retainer for curing tube. 4,030,863, Cl. 425-17.000.
Macpherson, Roy Duncan: *See—*
Atmore, Milton Graham Montgomery; and Macpherson, Roy Duncan, 4,030,989.
Madej, Edward A., to Robroy Industries. Molding apparatus. 4,030,866, Cl. 425-116.000.
Maeda, Tooru: *See—*
Yamamoto, Kenichi; Kirose, Yutaka; and Maeda, Tooru, 4,030,454.
Magee, Philip S., to Chevron Research Company. Fungicidal vinyl 2-substituted-thiovinyl sulfones. 4,031,247, Cl. 424-337.000.
Magerlein, Barney J., to Upjohn Company, The. Bicyclic intermediates for preparing 16-alkylated prostaglandin analogs. 4,031,081, Cl. 260-240.00R.
Maggioni, Virginio: *See—*
Gemmellaro, Carmelo; Maggioni, Virginio; and Moretti, Renzo, 4,030,759.
Magnin, Roland. Articulated bracelet. 4,030,287, Cl. 59-85.000.
Maguire, Roy L., to Caterpillar Tractor Co. Symmetrical seal assembly for a hinge joint. 4,030,730, Cl. 277-92.000.
Maier, Vincent P.: *See—*
Guadagni, Dante G.; Horowitz, Robert M.; Gentili, Bruno; and Maier, Vincent P., 4,031,265.
Maillard, Jacques Georges, to Laboratoires Jacques Logeais. Phenylacetic acids. 4,031,133, Cl. 260-520.00R.
Maillefer S.A.: *See—*
Veyrassat, Louis, 4,030,673.
Mains, Donald M.: *See—*
Christian, Edward H.; Mains, Donald M.; and Treiber, James H., 4,031,440.
Mais, James W.; and Myers, L. Paul, to A-T-O Inc. Filling head detection device. 4,030,269, Cl. 53-61.000.
Makedonski, Boris Georgiev: *See—*
Kochemidov, Atanas Dimitrov; Makedonski, Boris Georgiev; Dumanov, Ivan Minkov; Payakov, Stefan Georgiev; Galabov, Peter Konstantinov; and Atanassov, Haralampi Aangelov, 4,030,249.
Makino, Shinichi: *See—*
Kokado, Naoyuki; and Makino, Shinichi, 4,031,470.
Malagari, Frank A., Jr.: *See—*
Shilling, Jack W.; Datta, Amitava; and Malagari, Frank A., Jr., 4,030,950.
Malizia, Peter Donato; and Mitchell, William Alexander, to General Foods Corporation. Fixing acetaldehyde in sucrose. 4,031,255, Cl. 426-534.000.
Malkki, Yrjo: *See—*
Suortti, Mikko Tapani; Malkki, Yrjo; and Nikkila, Olavi Elis, 4,031,253.
Mallinckrodt, Inc.: *See—*
El-Antably, Samir M., 4,031,218.
Mallow, William A., to Southwest Research Institute. Cement composition. 4,030,939, Cl. 106-74.000.
Malobabic, Peter: *See—*
Buzzi, Leo; Buzzi, Valentin; Opietnik, Walter; Liebl, Helmut; and Malobabic, Peter, 4,030,573.
Malovik, Vladlen Vasilievich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.
Mandai, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; and Sato, Michito, to Lion Fat & Oil Co., Ltd. Method for preparation of polyolefin oil. 4,031,159, Cl. 260-683.15B.
Mandilaras, Stephen Emmanuel. Haircutting machine. 4,030,193, Cl. 30-30.000.
Mandras, Christian Maurice; and Stanik, Carol, to Societe Metallurgique de Revigny. Automatic device for seizing the end of a drawn product for a drum of a drawing bench. 4,030,680, Cl. 242-78.300.
Manduley, Flavio M.: *See—*
Dlugos, Daniel F.; and Manduley, Flavio M., 4,031,402.
Mankouski, Peter. Steam power plant. 4,030,302, Cl. 60-667.000.
Mann, Samuel, to Inverness Corporation. Sterile earlobe-piercing assembly. 4,030,507, Cl. 128-330.000.
Manner, James A., to PPG Industries, Inc. Drying of dialkyl peroxydicarbonates. 4,031,126, Cl. 260-463.000.
Mannesmann Aktiengesellschaft: *See—*
Bellmann, Manfred; and Goldberg, Hannes, 4,030,333.
Wunnenberg, Klaus; and Dubendorff, Joachim, 4,030,531.
Mapal Dr. Kress KG: *See—*
Kress, Dieter, 4,030,855.
Marcantonio, Livio F., to Chicago Pneumatic Tool Company. Sanding shoe with removable clamping jaw. 4,030,254, Cl. 51-386.000.
Marchetti, Joseph R.: *See—*
Dowbenko, Rostyslaw; and Marchetti, Joseph R., 4,031,051.
Maresh, Richard L. Chopped light relay keyer. 4,031,560, Cl. 361-175.000.
Margolis, Geoffrey; Rushmore, Dean Frederick; and Liu, Richard Tien-Szu, to Societe d'Assistance Technique pour Produits Nestle S.A. Decaffeination of vegetable material. 4,031,251, Cl. 426-387.000.
Mariner, Ralph E. Acoustic pickups. 4,030,396, Cl. 84-1.160.
Marinkovich, Vincent A., to GTE New Ventures Corporation. In vitro method for determining allergic hypersensitivity. 4,031,197, Cl. 424-1.000.
Marker, Delbert E.: *See—*
Leyde, Warren L.; and Marker, Delbert E., 4,031,406.
Marlin, Louis Allen; and Beaucaire, Victor D., to Interlake, Inc. Stabilized fuel slurry. 4,030,894, Cl. 44-51.000.
Marquette Metal Products Company: *See—*
Lowery, Robert D.; and Mehrbrodt, Alphonso W., 4,030,584.
Martin, Adolph; and Edwards, William Joseph, to Singer Company, The. Sewing machine take-up thread shield. 4,030,431, Cl. 112-241.000.
Martin, Blair Robertson; Meier, Johann Hans; and Raider, Jerry Wesley, to International Business Machines Corporation. Controls for a movable disk printer. 4,030,591, Cl. 197-53.000.
Martin, Jean, to Groupement Atomique Alsacienne Atlantique. High energy laser beam cutting method and apparatus. 4,031,351, Cl. 219-121.00L.
Martin, Jose Luis: *See—*
Aparicio, Luis; Gayo, Nenesio; M^{a} ; Martin, Jose Luis; and Ron, Armando, 4,031,243.
Martin, Lawrence Leo; and Duffy, Brian J., to American Hoechst Corporation. 1,3-Dihydro-heteroarylspiro (isobenzofuran)s. 4,031,224, Cl. 424-267.000.
Martin Marietta Corporation: *See—*
Strauss, Eric L., 4,031,059.
Martz, Lyle F.; and Plotnick, Richard J., to Westinghouse Electric Corporation. Combined cycle electric power plant and a heat recovery steam generator having improved temperature control of the steam generated. 4,031,404, Cl. 290-40.00R.
Marvin Glass & Associates: *See—*
Allen, Robert K.; Schoenfield, Palmer J.; and Morrison, Howard J., 4,030,234.
Terzian, Rouben T.; Schoenfield, Palmer J.; Dunn, Kathy A.; and Kuna, Wayne A., 4,030,235.
Masaki, Kenji; and Minami, Hidehiro. Method and apparatus of controlling an air fuel mixture for a multi-cylinder internal combustion engine. 4,030,292, Cl. 60-274.000.
Masao, Ishihara: *See—*
Akira, Kato; Akira, Itoh; Tohru, Uchida; and Masao, Ishihara, 4,030,921.
Maschenko, Valery Mikhailovich: *See—*
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.
Maschinenbau Oppenweiler GmbH: *See—*
Kistner, Hermann; and Lehmann, Gunthart, 4,030,394.

Maschinenfabrik Fahr Aktiengesellschaft: *See—*
Ruprecht, Hermann, 4,030,275.
Mascia, Frank P.: *See—*
Wuthrich, Paul; and Mascia, Frank P., 4,031,341.
Masco Corporation: *See—*
Rasor, William A.; Van Dine, Walter S.; and Whitney, Frank A., 4,030,647.
Mason, Burton Hoster. Work arm system for submergible chamber. 4,030,309, Cl. 61-69.00R.
Massachusetts Institute of Technology: *See—*
Cardillo, Mark J., 4,031,397.
Massey-Ferguson Services N.V.: *See—*
Bailey, Alfred J.; and Dean, Malcolm, 4,030,641.
Matthews, Harry, 4,030,624.
Massonne, Joachim: *See—*
Becher, Wilfried; and Massonne, Joachim, 4,031,193.
Masuda, Takao: *See—*
Noguchi, Yasuhiro; Ukai, Toshinao; Sashihara, Kenji; and Masuda, Takao, 4,030,931.
Sashihara, Kenji; Masuda, Takao; Noguchi, Yasuhiro; Sekikawa, Nobuyoshi; and Shishido, Tadao, 4,030,930.
Matsumoto, Seiichi: *See—*
Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 4,031,383.
Matsumoto, Seiji: *See—*
Honjo, Satoru; and Matsumoto, Seiji, 4,030,922.
Matsuo, Takashi: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,031,235.
Matsuoka, Sadao: *See—*
Onishi, Makoto; Nagano, Katsuyuki; Tanaka, Toshiki P.; Matsuoka, Sadao; and Tanaka, Mitsuo, 4,030,809.
Matsushita Electric Industrial Co., Ltd.: *See—*
Enomoto, Shigeru, 4,031,430.
Kohashi, Tadao; and Kurosawa, Toshiharu, 4,030,813.
Okamura, Yasushi; Tanaka, Kiichiro; and Takeda, Takashi, 4,031,337.
Sakamoto, Yoichi, 4,031,491.
Mattel, Inc.: *See—*
White, Peter Charles; Benson, John Terry; and Leoncavallo, Richard Anthony, 4,030,239.
Matthews, Harry, to Massey-Ferguson Services N.V. Loader vehicles. 4,030,624, Cl. 214-145.00A.
Mattila, Alvin. Nasal filter. 4,030,491, Cl. 128-140.00N.
Mattos, Albert V. Bridge bidding indicator. 4,030,764, Cl. 273-148.00A.
Matulevich, E. S., to General Electric Company. Locked axle detector for a multi-axled traction vehicle. 4,031,509, Cl. 340-62.000.
Matulis, Raymond M.: *See—*
Meisner, Merlin M.; Matulis, Raymond M.; and Mackey, James R., 4,030,959.
Maudlin, Jerry A.: *See—*
Kniss, Edward L., Jr.; Hixenbaugh, Dennis L.; Maudlin, Jerry A.; and Brozenick, Nicholas J., 4,030,740.
Maunder, Leonard: *See—*
Bulman, David Nicholas; and Maunder, Leonard, 4,030,371.
Maurushat, Ewalt: *See—*
King, Donald J.; Lura, Loren E.; and Maurushat, Ewalt, 4,030,784.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Hoppe, Walter, 4,031,391.
Mayers, Bernard J.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., 4,031,256.
Maynard, James Lucian: *See—*
Holloran, Thomas Patrick; Braden, Arthur Buell; Foley, Jerrold Stokes; Maynard, James Lucian; Klosky, John Patrick; Dissauer, Gerald Anthony; Adams, Terrence Miller; and Lorenz, Allan Alfred, 4,031,518.
Mayrl, Jose A.: *See—*
Miller, Charles H.; and Mayrl, Jose A., 4,031,285.
Mazanek, Alfonso J., to Westinghouse Electric Corporation. Electrical bushing. 4,031,311, Cl. 174-31.00R.
Maze, Robert Craig, to Motorola, Inc. Nematic liquid crystal composition. 4,031,028, Cl. 252-299.000.
Maznichenko, Stanislav Anisimovich: *See—*
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.
McCarthy, Joseph J. Holder and dispenser for removable jewelry inserts. 4,030,605, Cl. 206-525.000.
McCarthy, Peter A. Coin container. 4,030,597, Cl. 206-.830.
McCarty, Glenn L.: *See—*
Hughes, Theodore R.; and McCarty, Glenn L., 4,031,555.
McClain, Herbert D.; Parikh, Bipin D.; and Burkey, John K., to NCR Corporation. Data communications system with improved digital phase-locked loop retiming circuit. 4,031,317, Cl. 178-69.100.
McClinton, John L., to Burns & Russell Company, The. Simulated traditional sand-finished masonry. 4,031,282, Cl. 428-141.000.
McCloskey, Albert R., to Heim Universal Corporation. Self-adjusting spherical bearing. 4,030,783, Cl. 308-72.000.
McCombie, Alan Keith, to Molins Machine Company, Limited. Laterally flexible conveyor construction. 4,030,595, Cl. 198-778.000.
McCord, Andrew T., to Christensen, Donald L., a part interest. Process for reclaiming cement kiln dust and recovering chemical values therefrom. 4,031,184, Cl. 423-197.000.
McDonald, David, to Golden M Enterprises, Inc. Earlobe piercing device. 4,030,506, Cl. 128-330.000.
McEachran, Dennis B., to Quadrelax Corporation. Foldable vibration massage device. 4,030,487, Cl. 128-24.100.
McGarry, Errol James: *See—*
Forsyth, Bruce Adam; Pryor, David Ernest; McGarry, Errol James; and Harney, Donald William Gerald, 4,031,249.
McGarry, George: *See—*
Woods, Gilbert Frederick; Logan, Robert Thomas; McGarry, George; and Roy, Robert Gibson, 4,031,075.
McGinley, Edward J. Instructional system for teaching and testing word pronunciation and spelling. 4,030,211, Cl. 35-35.00H.
McGinn, Ferdinand M., to Production Specialties, Inc. Well tubing mandrel with combination guard, guide and latch arrangement. 4,030,543, Cl. 166-117.500.
McGowan, Edward J., Jr.: *See—*
Kuska, Walter J.; and McGowan, Edward J., Jr., 4,030,484.
McGuire, James T. Wall decorating paint applying device. 4,030,414, Cl. 101-379.000.
McKay, Dwight L., to Phillips Petroleum Company. Passivating metals on cracking catalysts with antimony compounds. 4,031,002, Cl. 208-113.000.
McKeen, Edwin E., Jr. Tow strap for pneumatic inner tube. 4,030,151, Cl. 9-1.700.
McKenzie, Wray V., to Babson Bros. Co. Tank washer. 4,030,513, Cl. 134-167.00R.
McMath, Jack Alan; Wilder, Paul R.; and Alderson, Larry Lee, to Dover Corporation. Coupler. 4,030,524, Cl. 137-614.060.
McNall, Lester Ray, to Thompson-Hayward Chemical Co. Copper algaecide of increased stability and method of producing the same. 4,030,907, Cl. 71-67.000.
McNeil Corporation: *See—*
Webb, Nolan J., 4,030,479.
McNeil Laboratories, Incorporated: *See—*
Mohrbacher, Richard J.; and Grous, Philip P., 4,031,079.
McNeill, Charles: *See—*
Linck, Donald W., II; and Kaprelian, George, 4,030,197.
McShane, James L., to Westinghouse Electric Corporation. Method of making a metal enclosed transducer assembly. 4,030,175, Cl. 29-25.350.
Mead Corporation, The: *See—*
Paranjpe, Suresh C., 4,031,561.
Paranjpe, Suresh C.; and Moore, Daniel W., 4,031,563.
Meckler, Gershon. Method for forming wiring channels in a concrete floor. 4,030,259, Cl. 52-221.000.
Mehrbrodt, Alphonso W.: *See—*
Lowery, Robert D.; and Mehrbrodt, Alphonso W., 4,030,584.
Meier, Johann Hans: *See—*
Martin, Blair Robertson; Meier, Johann Hans; and Raider, Jerry Wesley, 4,030,591.
Meijer, Roelf Jan, to U.S. Philips Corporation. Swash-plate drive mechanism. 4,030,404, Cl. 92-12.200.
Meiners, Elmo R., to M & W Gear Company. Dual wheel construction. 4,030,753, Cl. 301-36.00R.
Meisner, Merlin M.; Matulis, Raymond M.; and Mackey, James R., to Hallmark Cards, Incorporated. Apparatus for transferring design image to wax articles. 4,030,959, Cl. 156-457.000.
Meixner, Rudolf; and Kling, Gunter, to Daimler-Benz Aktiengesellschaft. Fender, especially rear fender for passenger motor vehicles. 4,030,773, Cl. 280-153.00R.
Melcher, Conway H.: *See—*
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 4,030,424.
Melin, Christian: *See—*
Nilsson, Sven A.; and Melin, Christian, 4,030,382.
Melnikov, Igor V., to Kimberly-Clark Corporation. Flexible hatch cover. 4,030,629, Cl. 220-211.000.
Mendelsohn, Lewis Isaac; and Nesbitt, Ethan Allen, to Allied Chemical Corporation. Flexible electromagnetic shield comprising interlaced glassy alloy filaments. 4,030,892, Cl. 428-226.000.
Mendoza, Fausto Celorio. Burner, especially for gaseous fuels. 4,030,669, Cl. 239-590.000.
Merck & Co., Inc.: *See—*
Kahan, Frederick M., 4,031,231.
Karady, Sandor; and Amato, Joseph S., 4,031,086.
Kollonitsch, Janos, 4,030,994.
Pines, Seemon H.; and Kozlowski, Matthew A., 4,031,085.
Provost, Philip J.; Ittensohn, Oswald L.; and Hilleman, Maurice R., 4,031,203.
Remy, David C., 4,031,222.
Remy, David C., 4,031,223.
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 4,031,125.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Gottschlich, Rudolf; Rogalski, Werner; Bergmann, Rolf; Steinigeweg, Rosmarie; and Wahlig, Helmut, 4,031,230.
Nieschulz, Otto; Rudiger, Gunther; and Maass, Jurgen, 4,031,199.

Merck Sharp & Dohme (I.A.) Corporation: *See—*
Williams, Haydn Windsor Richard; and Rooney, Clarence Stanley, 4,031,103.
Merkenich, Karl: *See—*
Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; Henning, Klaus; and Kandler, Joachim, 4,031,022.
Merlette, John Barton, to Hercules Incorporated. Composite lightweight wheel rim. 4,030,754, Cl. 301-98.000.
Merrihew, Larry D.; and Zeck, Phillip. Portable tennis court. 4,030,733, Cl. 273-29.0BB.
Messer Griesheim GmbH: *See—*
Grund, Peter; Schmidt, Jurgen; and Hesse, Jurgen, 4,030,247.
Messing, Alan W.: *See—*
Westall, Edward B.; and Messing, Alan W., 4,031,260.
Messwandler-Bau GmbH: *See—*
Moeller, Jurgen; Mitrach, Werner; Krauss, Helmut; and Schulte, Hubert, 4,031,459.
Metal Box Company Limited, The: *See—*
Arnold, Robert Harry, 4,030,270.
Metallgesellschaft Aktiengesellschaft: *See—*
Rudolph, Paul, 4,031,030.
Metzger, Georg: *See—*
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,207.
Metzger, Karl Georg: *See—*
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Karl Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,208.
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,031,229.
Meyer, Ernst Jochen. Ocular decompression process. 4,030,480, Cl. 128-1.500.
Meyer, Horst: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 4,031,104.
Meyer, Richard C.: *See—*
Klein, Gerald Lee; and Meyer, Richard C., 4,031,399.
Meyer, Rudolf: *See—*
Stahlke, Kurt-Rainer; Krafft, Werner; Meyer, Rudolf; and Rosenkranz, Hans Jurgen, 4,030,926.
Michaud, James Anthony: *See—*
Heaman, James Patrick; and Michaud, James Anthony, 4,031,369.
Michonski, Ronald E., to General Electric Company. Adjustable cutting tool. 4,030,176, Cl. 29-96.000.
Microma Incorporated: *See—*
Eberhardt, Noel H., 4,031,348.
Middlesworth, Peter Van: *See—*
Berry, Martin F.; Reesman, Stanley H.; Smith, Marvin L.; and Middlesworth, Peter Van, 4,031,267.
Midland-Ross Corporation: *See—*
Durling, Harold, 4,030,757.
Mikoliczeak, John Joseph: *See—*
Strehler, John Frederick; Mikoliczeak, John Joseph; and Strehler, Kirk Robert, 4,030,314.
Mikuni Kogyo Kabushiki Kaisha: *See—*
Asao, Makoto; Ito, Susumu; and Umehara, Hidetoshi, 4,031,171.
Miller, Charles H.; and Mayrl, Jose A. Lightweight, reinforced foamed organic polymer and cementitious material structure. 4,031,285, Cl. 428-294.000.
Miller, Clark Ober, to Lubrizol Corporation, The. Nitrile-amine reaction products. 4,031,015, Cl. 252-50.000.
Miller, Clark Ober, to Lubrizol Corporation, The. Ester-containing process and compositions. 4,031,118, Cl. 260-404.500.
Miller, Donald L., to Facet Enterprises, Inc. Fail safe electric cone clutch. 4,030,583, Cl. 192-84.00C.
Miller, Isobel, to Droll Yankees, Inc. Bird feeder. 4,030,451, Cl. 119-51.00R.
Miller, Larry J.: *See—*
Liebetrau, Richard E.; and Miller, Larry J., 4,030,609.
Miller, Leonard G.; and Hale, Raymond P., to Molmec, Inc. Locating ring for injection molds. 4,030,869, Cl. 425-247.000.
Miller, Leroy J.; and Grinberg, Jan, to Hughes Aircraft Company. Method of aligning liquid crystals. 4,030,997, Cl. 204-192.00E.
Miller, Stanley J.; and Heniser, Richard J., to Gulf & Western Manufacturing Company (Hastings). Can trimming apparatus. 4,030,432, Cl. 113-7.00R.
Milliflect: *See—*
Rutschow, Joseph Fredrick; and Zucconi, Bruno, 4,030,953.
Milliken Research Corporation: *See—*
Brown, Robert Saul; Eschenbach, Paul W.; and King, Herbert Ray, 4,030,582.
Warthen, William P., 4,030,743.
Minami, Hidehiro: *See—*
Masaki, Kenji; and Minami, Hidehiro, 4,030,292.
Minami, Hiroshi, to Hokushin Electric Works, Ltd. Anti-corrosion ultrasonic transducer. 4,031,503, Cl. 340-11.000.
Mine Safety Appliances Company: *See—*
Poli, Albert A.; Bossart, Clayton J.; and Benzie, Thomas P., 4,030,887.
Minnesota Mining and Manufacturing Company: *See—*
Archibald, G. Kent, 4,030,501.
Holmen, Reynold E.; and Olander, Stanley J., 4,031,048.
Jackson, Richard A.; and Bolles, Theodore F., 4,031,198.
Kohler, Gunter A., 4,031,188.
Koshar, Robert J., 4,031,036.
Stenemann, Heinrich F., 4,030,958.
Strebel, Elwood L., 4,030,812.
Strebel, Elwood L., 4,031,092.
Mioduski, George T., to Western Geophysical Company of America. Gain ranging amplifier system. 4,031,504, Cl. 340-15.5GC.
Miringoff, William: *See—*
Patel, Piyush J.; and Miringoff, William, 4,031,056.
Mirowski, Mieczyslaw: *See—*
Heilman, Marlin S.; Langer, Alois A.; Mirowski, Mieczyslaw; Mower, Morton M.; and Reilly, David M., 4,030,509.
Mitarai, Kaoru, to Trio Electronics Incorporated. Station selecting device having improved monitor. 4,031,473, Cl. 325-455.000.
Mitchell, David W.: *See—*
Sommer, Edward J., Jr.; Kenny, Garry R.; Knoll, Frank S.; and Mitchell, David W., 4,031,004.
Mitchell, Donald K.: *See—*
Hood, Frederick E.; Mitchell, Donald K.; and Uhring, Gary S., 4,030,439.
Mitchell, William A.; and Seidel, William C., to General Foods Corporation. Reconstitutable tomato beverage compositions. 4,031,266, Cl. 426-599.000.
Mitchell, William Alexander: *See—*
Malizia, Peter Donato; and Mitchell, William Alexander, 4,031,255.
Mitrach, Werner: *See—*
Moeller, Jurgen; Mitrach, Werner; Krauss, Helmut; and Schulte, Hubert, 4,031,459.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Hori, Kenji; and Nakamura, Shigeo, 4,030,459.
Nakagami, Tatsuro; and Kiyota, Yuhiko, 4,030,465.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Mizumoto, Yoshiaki; and Hasegawa, Shigeo, 4,031,039.
Mittnacht, Hans: *See—*
Bronstert, Klaus; Fahrbach, Gerhard; Krahe, Eduard; Ladenberger, Volker; Kastning, Ernst-Guenther; Mittnacht, Hans; Willersinn, Herbert; and Trieschmann, Hans-Georg, 4,031,166.
Miwa, Takeshi, to Ozawa, Juichiro. Thermal printer head. 4,030,408, Cl. 101-1.000.
Miyamoto, Noriaki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Driving method for tangential belt and apparatus therefor. 4,030,372, Cl. 74-221.000.
Miyatani, Yoshifusa: *See—*
Nagata, Toshio; Kawasaki, Kunijiro; Takahama, Ryuichiro; Miyatani, Yoshifusa; and Funakoshi, Sozo, 4,030,441.
Mizen, Neil J. Drill apparatus. 4,030,853, Cl. 408-10.000.
Mizumoto, Yoshiaki; and Hasegawa, Shigeo, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for treating waste high-polymer mixture. 4,031,039, Cl. 260-2.300.
Mizutani, Toshio: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,031,235.
Mjolsnes, Leonard Olaf: *See—*
Cacciola, Michael John; and Mjolsnes, Leonard Olaf, 4,030,578.
Mladek, Milos: *See—*
Rambousek, Miroslav; Kapl, Ladislav; and Mladek, Milos, 4,030,279.
Mobil Oil Corporation: *See—*
Gough, Stanley T.; Tobias, Michael A.; and Napier, Roger P., 4,031,237.
Strong, Jerry G., 4,030,908.
Mochizuki, Kasunori: *See—*
Ban, Itsuki; and Mochizuki, Kasunori, 4,031,557.
Mochizuki, Kazunori: *See—*
Ban, Itsuki; and Mochizuki, Kazunori, 4,031,556.
Mochizuki, Kiyoshi: *See—*
Togo, Masaaki; Shima, Masao; and Mochizuki, Kiyoshi, 4,031,447.
Mochizuki, Noritaka: *See—*
Goshima, Takeshi; and Mochizuki, Noritaka, 4,030,806.
Moeller, Jurgen; Mitrach, Werner; Krauss, Helmut; and Schulte, Hubert, to Messwandler-Bau GmbH. Inductive voltage transformer for a high-voltage metal-clad switch-gear installation. 4,031,459, Cl. 323-60.000.
Mohrbacher, Richard J.; and Grous, Philip P., to McNeil Laboratories, Incorporated. Intermediates for 2-aminobenzodiazepine-5-ones. 4,031,079, Cl. 260-239.30D.
Moiroud, Guy: *See—*
Felix, Pierre; Gamot, Philippe; Moiroud, Guy; and Veron, Serge, 4,031,394.
Molbert, Robert A., to General Tire & Rubber Company, The. Method of injection molding expanded thermoplastics and articles produced thereby. 4,031,176, Cl. 264-45.200.
Molins Machine Company, Limited: *See—*
McCombie, Alan Keith, 4,030,595.
Moll, Eberhard; and Walch, Leo M., Jr., to Rockwell International Corporation. Electromechanical counter. 4,031,361, Cl. 235-92.00C.
Molmec, Inc.: *See—*
Miller, Leonard G.; and Hale, Raymond P., 4,030,869.
Molson Companies Limited, The: *See—*
Duncan, Alexander Ritchie, 4,030,529.
Momoki, Yoshio: *See—*
Sasaki, Kazuya; Naito, Takanobu; Momoki, Yoshio; Sega, Toshio; and Satomi, Toshiyuki, 4,031,215.
Monier, John L.: *See—*
Lasswell, Tull C.; and Monier, John L., 4,031,277.

Monks, Reginald: *See—*
Bayly, Russell James; Chambers, Virginia Edith May; and Monks, Reginald, 4,030,886.
Monolithic Systems Corporation: *See—*
DeVries, Hubert G., 4,031,371.
Monroe Auto Equipment Company: *See—*
Palmer, Dale A., 4,030,713.
Monsanto Company: *See—*
Birum, Gail H., 4,031,170.
Hahn, Frank J.; and Santer, James O., 4,031,057.
Hedrick, Ross Melvin; and Gabbert, James D., 4,031,164.
Montanus Industrieanlagen GmbH: *See—*
Dorgathen, Friedrich, 4,031,011.
Montedison S.p.A.: *See—*
Pieri, Giampiero; Carlini, Filippo Maria; Paffoni, Camillo; and Boffa, Gioacchino, 4,031,096.
Mooney, Thomas: *See—*
Eidelberg, Jonah; and Mooney, Thomas, 4,030,742.
Moore, Daniel W.: *See—*
Paranjpe, Suresh C.; and Moore, Daniel W., 4,031,563.
Moore, Peter F.: *See—*
Kadin, Saul B.; and Moore, Peter F., 4,031,217.
Moore, Randolph Gaylon: *See—*
Bouvier, David William; Green, William Geary; and Moore, Randolph Gaylon, 4,031,462.
Moore, Robert L.: *See—*
Fish, Leonard A.; and Moore, Robert L., 4,030,559.
Moppett, Charles E.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,031,206.
Morbark Industries, Inc.: *See—*
Smith, Leward N.; and Morey, Larry L., 4,030,606.
Moreton, George C., to Electronic Data Controls Corporation. Blender. 4,030,707, Cl. 259-8.000.
Moretti, Renzo: *See—*
Gemmellaro, Carmelo; Maggioni, Virginio; and Moretti, Renzo, 4,030,759.
Morey, Larry L.: *See—*
Smith, Leward N.; and Morey, Larry L., 4,030,606.
Morgan Construction Company: *See—*
Smola, Raymond L., 4,030,183.
Mori, Atsushi; and Muramoto, Hiroo, to Nippon Soda Company Limited. Flexible polybutadiene resin composition having excellent electrical properties. 4,031,066, Cl. 260-77.5CR.
Mori, Yasunori: *See—*
Sugiura, Noboru; Mori, Yasunori; and Suda, Seiji, 4,030,468.
Moring, Rodger L.; and Frauenhoff, Richard E., to Caterpillar Tractor Co. Piston assembly with safety vent means for brakes and the like. 4,030,575, Cl. 188-71.100.
Morita, Masahiro. Quick freezing apparatus. 4,030,898, Cl. 62-345.000.
Morita, Masato; Morita, Reiko; and Otozai, Kiyoteru, to International Nuclear Fuel Co., Ltd. Method for the analysis of isotopes. 4,031,388, Cl. 250-272.000.
Morita, Reiko: *See—*
Morita, Masato; Morita, Reiko; and Otozai, Kiyoteru, 4,031,388.
Morooka, Yasuo; and Tanifuji, Shinya, to Hitachi, Ltd. Gage control apparatus and method for tandem rolling mills. 4,030,326, Cl. 72-8.000.
Moroz, Jury Antonovich: *See—*
Grigorenko, Anatoly Sergeevich; Moroz, Jury Antonovich; and Landyshev, Vladimir Vladislavovich, 4,030,336.
Morris, H. Rodney. Wear determination of drilling bits. 4,030,558, Cl. 175-39.000.
Morris, Harris L., to Uniroyal Inc. Thermoplastic elastomeric polymer blend. 4,031,169, Cl. 260-897.00A.
Morrison, Charles B., to Phillips Petroleum Company. Rotary feeder construction. 4,030,642, Cl. 222-368.000.
Morrison, Charles Glenn: *See—*
Dudonis, Ronald Michael; Morrison, Charles Glenn; Potter, Robert Lawrence; and Streisand, Kenneth, 4,031,325.
Morrison, Donald R., to Morrison, Lewis T., a part interest. Vibrating concrete screed. 4,030,873, Cl. 425-456.000.
Morrison, Howard J.: *See—*
Allen, Robert K.; Schoenfield, Palmer J.; and Morrison, Howard J., 4,030,234.
Morrison, Lewis T.: *See—*
Morrison, Donald R., 4,030,873.
Morsch, Dieter: *See—*
Jacob, Friedrich; and Morsch, Dieter, 4,030,772.
Morse, Charles Richard; and Ross, Alan Leslie, to Morse, Charles Richard. Sheet structure hoisting gripper. 4,030,747, Cl. 294-92.000.
Morton-Norwich Products, Inc.: *See—*
Pelosi, Stanford S., Jr., 4,031,113.
Mory, Rudolf; and Hari, Stefan, to Ciba-Geigy Corporation. Monoazo pigments containing barbituric acid or thio- or imino-derivatives thereof. 4,031,073, Cl. 260-154.000.
Moschetto, Yves J. M.: *See—*
Delhaye, Michel; Moschetto, Yves J. M.; and Dhamelincourt, Paul, 4,030,827.
Mosciano, Gerard Joseph: *See—*
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,031,140.
Mosher, Peter J.: *See—*
Smith, Richard L.; and Mosher, Peter J., 4,030,352.
Moss, Philip H.: *See—*
Nieh, Edward C. Y.; and Moss, Philip H., 4,031,138.
Motegi, Masayoshi: *See—*
Kojima, Kojiro; Sakurai, Yoshihisa; Sugai, Tetuya; and Motegi, Masayoshi, 4,030,837.
Motorola, Inc.: *See—*
Bouvier, David William; Green, William Geary; and Moore, Randolph Gaylon, 4,031,462.
Desai, Samir Thakorbhai, 4,031,319.
Havens, Richard Calvin, 4,031,486.
Lace, Melvin Arthur, 4,030,466.
Maze, Robert Craig, 4,031,028.
Shaw, Mark Layne, 4,031,477.
Mott, James D., to Hydril Company. Method of operating a subsurface safety valve in response to an increase or decrease in ambient well fluid pressure. 4,030,550, Cl. 166-314.000.
Mount Royal Transportation Equipment Ltd.: *See—*
Strahm, Charles, 4,030,749.
Mower, Morton M.: *See—*
Heilman, Marlin S.; Langer, Alois A.; Mirowski, Mieczyslaw; Mower, Morton M.; and Reilly, David M., 4,030,509.
Mueller, Von W.: *See—*
Jameel, Khaja M.; Mueller, Von W.; and Foerster, Ronald A., 4,031,460.
Muller, Gunter; and Kluge, Reimund, to AGFA-Gevaert, A.G. Device for separably coupling section of cassettes for motion picture film or the like. 4,030,602, Cl. 206-404.000.
Muller, Karl-Heinz; Rindfleisch, Volker; Rauch, Moriz V.; and Willasch, Dieter, to Siemens Aktiengesellschaft. Method of operating a particle-beam apparatus. 4,031,390, Cl. 250-307.000.
Mulvey, Dennis M.: *See—*
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 4,031,125.
Muradian, Georgy Avanesovich: *See—*
Khcheyan, Khachik Egorovich; Revenko, Olga Mikhailovna; Shatalova, Alla Nikolaevna; Gelperina, Eleonora Grigorievna; Agrinskaya, Lidia Ivanovna; and Muradian, Georgy Avanesovich, 4,031,128.
Murai, Hiromu; Kitaguchi, Koji; Suminokura, Tatsuo; Sano, Akira; Kise, Masahiro; Kitano, Masahiko; and Tomita, Toshio, to Nippon Shinyaku Co., Ltd. Steryl-β-D-glucoside esters and method of preparation. 4,031,303, Cl. 536-5.000.
Muramoto, Hiroo: *See—*
Mori, Atsushi; and Muramoto, Hiroo, 4,031,066.
Muraviev, Ernest Nikolaevich: *See—*
Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tatarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,030,891.
Murayama, Koichi: *See—*
Fujita, Shigeru; Murayama, Koichi; and Kaneda, Toyohito, 4,030,987.
Murphy, Richard D., to Schlumberger Technology Corporation. Methods and apparatus for pulse height analyzer offset control. 4,031,367, Cl. 235-151.300.
Murphy, Zatis L., to Shell Oil Company. Auxiliary antioxidants. 4,031,018, Cl. 252-47.500.
Muryobayashi, Keiko: *See—*
Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Aishita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, 4,030,977.
Musser, Jerry Lee; and Koch, Frederick William, to Lubrizol Corporation, The. Lubricating compositions and methods utilizing hydroxy thioethers. 4,031,023, Cl. 252-48.200.
Mutter, Werner, to Ing. Alfred Schmidt GmbH. Safety gear change apparatus for snow clearing vehicles. 4,030,380, Cl. 74-866.000.
Muzyka, Donald R.; and Walley, Robert F., to Carpenter Technology Corporation. Eliminating prior particle boundary delineation. 4,030,946, Cl. 148-11.50P.
Myers, Gary L.; and Staiger, Donald W., to HPM Corporation. Method for facilitating access to the mold halves of a molding machine. 4,030,186, Cl. 29-427.000.
Myers, Harry K., Jr.: *See—*
Suld, George; Schneider, Abraham; and Myers, Harry K., Jr., 4,031,150.
Myers, L. Paul: *See—*
Mais, James W.; and Myers, L. Paul, 4,030,269.
Naegeli, Peter, to Givaudan Corporation. Isopropenyl cyclopentene carboxylic acids. 4,031,132, Cl. 260-514.00L.
Nagae, Yasuyuki, to Central Glass Co., Ltd. Float glass band width control method. 4,030,902, Cl. 65-29.000.
Nagamine, Seiichi: *See—*
Suzuki, Kazuo; Hayashi, Yoshiaki; and Nagamine, Seiichi, 4,031,287.
Nagano, Katsuyuki: *See—*
Onishi, Makoto; Nagano, Katsuyuki; Tanaka, Toshiki P.; Matsuoka, Sadao; and Tanaka, Mitsuo, 4,030,809.
Nagano, Masashi, to Shimano Industrial Company, Limited. Derailleur for bicycle. 4,030,375, Cl. 74-217.00B.
Nagata, Toshio; Kawasaki, Kunijiro; Takahama, Ryuichiro; Miyatani, Yoshifusa; and Funakoshi, Sozo, to Kohan Sendan Kikai Kabushiki Kaisha; Sasebo Jukogyo Kabushiki Kaisha; and Nishi Nippon Harbor Service Kabushiki Kaisha. Device for connecting tugboat with ship to be tugged. 4,030,441, Cl. 114-242.000.

Nagata, Yasunori; Itoh, Hirotaka; Yazaki, Susumu; Hamamura, Takayuki; and Yoshiya, Shigeo, to Kanebo, Ltd. Method for continuously washing a yarn with a washing liquid. 4,030,884, Cl. 8-151.200.

Nagayama, Masuzo: *See—*
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; Taniyasu, Ryozo; and Nagayama, Masuzo, 4,031,158.

Naito, Takanobu: *See—*
Sasaki, Kazuya; Naito, Takanobu; Momoki, Yoshio; Sega, Toshio; and Satomi, Toshiyuki, 4,031,215.

Najer, Henry: *See—*
Giudicelli, Don Pierre Rene Lucien; and Najer, Henry, 4,031,094.

Nakagami, Tatsuro; and Kiyota, Yuhiko, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Multi-cylinder internal combustion engine. 4,030,465, Cl. 123-127.000.

Nakahata, Kimio: *See—*
Takahashi, Toru; Nakahata, Kimio; and Kadowaki, Hidejiro, 4,030,447.

Nakai, Tomotoshi; Utsumi, Kazuaki; and Ohno, Tomeji, to Nippon Electric Co., Ltd. Ceramic dielectric material having improved temperature stability. 4,030,937, Cl. 106-73.200.

Nakamoto, Yukimasa: *See—*
Yamaguchi, Kineo; Kawakami, Katsuhiko; and Nakamoto, Yukimasa, 4,031,031.

Nakamura, Nobutaka; and Saeki, Yukio, to Sumitomo Durez Company, Ltd. Preparation of densified wood impregnated with phenolic resins. 4,031,276, Cl. 427-369.000.

Nakamura, Shigeo: *See—*
Hori, Kenji; and Nakamura, Shigeo, 4,030,459.

Nakamura, Tadashi; Hagiwara, Hisami; and Kokubu, Yoshikazu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Diaphragm for electrolytic production of caustic alkali. 4,031,000, Cl. 204-252.000.

Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, to Sumitomo Chemical Company, Limited. Phenoxy carboxylic acid derivative. 4,031,134, Cl. 260-520.00C.

Nakanishi, Susumu, to Pfizer Inc. 2-Hydroxymethyl-3-benzyloxypyridine-6-epoxyethane. 4,031,108, Cl. 260-297.00R.

Nakayama, Michio; and Nakayama, Setuko, to Tojo, Eigo; and Nakayama, Sadao. Ice cream and the process for making same. 4,031,262, Cl. 426-565.000.

Nakayama, Sadao: *See—*
Nakayama, Michio; and Nakayama, Setuko, 4,031,262.

Nakayama, Setuko: *See—*
Nakayama, Michio; and Nakayama, Setuko, 4,031,262.

Napier, Roger P.: *See—*
Gough, Stanley T.; Tobias, Michael A.; and Napier, Roger P., 4,031,237.

Nashua Corporation: *See—*
Hiscoe, Ernest C., 4,030,619.

Nasutavicus, Wilmonte A.: *See—*
Grinstead, Robert R.; and Nasutavicus, Wilmonte A., 4,031,038.

Nathaniel, Elmer O. Ice skating surface. 4,030,729, Cl. 272-3.000.

National Patent Development Corporation: *See—*
Stockel, Richard Frederick; and Valenti, Peter Carl, 4,031,110.

National Research Development Corporation: *See—*
Bulman, David Nicholas; and Maunder, Leonard, 4,030,371.
Elloy, Martin Arthur; and Beddow, Frank Howard, 4,030,143.

National Semiconductor Corporation: *See—*
Allen, Robert M., 4,030,999.

National Steel Corporation: *See—*
Loest, Kent W., 4,031,182.

Navato, Jose Miguel Antonio Rosario, to Lake St. Louis Research Products, Inc. Contact fever thermometer. 4,030,482, Cl. 128-2.00H.

Naylor, Donald B. Sliding barn door. 4,030,246, Cl. 49-501.000.

NCR Corporation: *See—*
Biedermann, Horst H., 4,030,726.
Kessler, Clarence W., 4,030,589.
McClain, Herbert D.; Parikh, Bipin D.; and Burkey, John K., 4,031,317.
Wojdyla, Gary A., 4,030,590.
Wojdyla, Gary A.; and Hanna, Kenneth W., 4,030,677.

Nebolsine, Rostislav. Apparatus for cleansing well liner and adjacent formations. 4,030,545, Cl. 166-191.000.

Neef, Hanns-Joachim, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Core reactor. 4,030,974, Cl. 176-58.0PB.

Neeff, Rutger: *See—*
Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, 4,031,116.

Nelson, Gunner E., to Ethyl Corporation. Reduction using $NaAlEt_2H_2$. 4,031,143, Cl. 260-632.00D.

Nelson, Walter E. Electrically amplified musical instrument control apparatus. 4,030,397, Cl. 84-1.220.

Nentwich, Heinz Josef: *See—*
Ingrey, Sidney Ivor Joseph; Nentwich, Heinz Josef; and Poulsen, Robert Gordon, 4,030,967.

Nesbitt, Ethan Allen: *See—*
Mendelsohn, Lewis Isaac; and Nesbitt, Ethan Allen, 4,030,892.

Neumann, Leopold, to Analogic Corporation. Differential floating dual slope converter. 4,031,533, Cl. 340-347.0NT.

Newell, Harry Lee, Jr.: *See—*
Weiss, William Robert; Cooksey, James Judson; Stables, Wilbur Leon; and Newell, Harry Lee, Jr., 4,030,651.

Newman, David P. Ratchet wrench. 4,030,384, Cl. 81-58.300.

Newsom, Melvin M.: *See—*
Alvis, Robert L.; and Newsom, Melvin M., 4,030,557.

Nicolaides, Ernest D.; Tinney, Francis John; and French, James Clark, to Parke, Davis & Company. Tetrapeptides. 4,031,069, Cl. 260-112.5LH.

Nicolaides, Ernest D.: *See—*
Wittle, Eugene Leroy; and Nicolaides, Ernest D., 4,031,071.

Nieh, Edward C. Y.; and Moss, Philip H., to Texaco Development Corporation. Stable substituted acrylamides or methacrylamides. 4,031,138, Cl. 260-561.00N.

Nieman, Gerald R., to International Telephone and Telegraph Corporation. Electrical connector. 4,030,797, Cl. 339-64.00M.

Niemann, John A. Locking device for electrical plugs. 4,030,795, Cl. 339-37.000.

Nieschulz, Otto; Rudiger, Gunther; and Maass, Jurgen, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the production of allergen-containing extracts. 4,031,199, Cl. 424-12.000.

Niibe, Akitoshi. Heat panel safety system. 4,031,356, Cl. 219-509.000.

Nijenhuis, Anne Te: *See—*
Otter, Marinus J.A.M. Den; Nijenhuis, Anne Te; and Van Geenen, Albert A., 4,031,040.

Nikkila, Olavi Elis: *See—*
Suortti, Mikko Tapani; Malkki, Yrjo; and Nikkila, Olavi Elis, 4,031,253.

Nilsson, Sven A.; and Melin, Christian, to C O Oberg & Co AB. Sharpening device for steel ski edge strips. 4,030,382, Cl. 76-83.000.

Nippon Electric Co., Ltd.: *See—*
Nakai, Tomotoshi; Utsumi, Kazuaki; and Ohno, Tomeji, 4,030,937.
Noguchi, Toshitake, 4,031,471.
Suda, Kazuyoshi; Isono, Tomoyuki; Uchida, Takashi; and Tsuda, Kiyoshi, 4,030,607.

Nippon Felt Co., Ltd.: *See—*
Kato, Mikio, 4,030,149.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Deutsch, Ralph; and Griffith, Glen R., 4,031,377.

Nippon Hoso Kyokai: *See—*
Nobutoki, Saburo; Ogusu, Chihaya; and Sugimoto, Masao, 4,031,551.

Nippon Mining Co., Ltd.: *See—*
Yamaguchi, Kineo; Kawakami, Katsuhiko; and Nakamoto, Yukimasa, 4,031,031.

Nippon Oil Company, Ltd.: *See—*
Sugiura, Kensuke; Kagaya, Mineo; Fujisou, Tokuo; Aoki, Hiroyuki; Takehara, Takeichiro; and Kurata, Shigenori, 4,031,020.

Nippon Piston Ring Co., Ltd.: *See—*
Taniguchi, Isao, 4,030,767.

Nippon Shinyaku Co., Ltd.: *See—*
Murai, Hiromu; Kitaguchi, Koji; Suminokura, Tatsuo; Sano, Akira; Kise, Masahiro; Kitano, Masahiko; and Tomita, Toshio, 4,031,303.

Nippon Soda Company Limited: *See—*
Mori, Atsushi; and Muramoto, Hiroo, 4,031,066.

Nippon Soken, Inc.: *See—*
Yamaguchi, Shunzo; Ozaki, Tadashi; and Konomi, Toshiaki, 4,030,464.

Nippon Steel Corporation: *See—*
Ito, Yasuo; and Suzuki, Yoshitake, 4,030,534.
Itoh, Yasuo; Suzuki, Yoshitake; Shibutami, Hirohiko; Hirano, Koichi; and Tagami, Muneo, 4,030,533.
Kojima, Kojiro; Sakurai, Yoshihisa; Sugai, Tetuya; and Motegi, Masayoshi, 4,030,837.

Nippon Telegraph and Telephone Public Corporation: *See—*
Horikoshi, Yoshiji; and Furukawa, Yoshitaka, 4,030,949.

Nishi Nippon Harbor Service Kabushiki Kaisha: *See—*
Nagata, Toshio; Kawasaki, Kunijiro; Takahama, Ryuichiro; Miyatani, Yoshifusa; and Funakoshi, Sozo, 4,030,441.

Nishimiya, Torazo: *See—*
Sasayama, Takao; and Nishimiya, Torazo, 4,030,462.

Nishimoto, Minoru: *See—*
Fukui, Kiyoshige; Tamamura, Akira; and Nishimoto, Minoru, 4,030,725.

Nishizawa, Tetsuo, to Fuji Photo Optical Co., Ltd. Automatic fading device for motion picture camera. 4,030,820, Cl. 352-91.00C.

Nissan Chemical Industries, Ltd.: *See—*
Ogawa, Yoshihisa; Inazaki, Tsunenori; and Kouda, Michihiro, 4,031,194.

Nissan Motor Co., Ltd.: *See—*
Hata, Yoshitaka, 4,030,293.
Hiruma, Mituo, 4,030,739.
Sugiura, Kensuke; Kagaya, Mineo; Fujisou, Tokuo; Aoki, Hiroyuki; Takehara, Takeichiro; and Kurata, Shigenori, 4,031,020.
Yanagishima, Takayuki; and Inoue, Naohiko, 4,031,527.

Niva, Russell N. Collapsible crustacean trap. 4,030,232, Cl. 43-105.000.

Nixdorf Computer AG: *See—*
Huellwegen, Josef, 4,031,480.

Nobutoki, Saburo; Ogusu, Chihaya; and Sugimoto, Masao, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Image pickup device. 4,031,551, Cl. 358-223.000.

Noguchi, Toshitake, to Nippon Electric Co., Ltd. Automatic frequency control circuit. 4,031,471, Cl. 325-423.000.

Noguchi, Yasuhiro; Ukai, Toshinao; Sashihara, Kenji; and Masuda, Takao, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,030,931, Cl. 96-114.100.

Noguchi, Yasuhiro: *See—*
Sashihara, Kenji; Masuda, Takao; Noguchi, Yasuhiro; Sekikawa, Nobuyoshi; and Shishido, Tadao, 4,030,930.

Noll, Robert W., to Cambridge Filter Corporation. Portable air velocity measuring unit. 4,030,358, Cl. 73-212.000.

Nor-Am Resources Technology Inc.: *See—*
Willums, Jan-Olaf, 4,030,216.

Norberg, Gayle Russell, to Control Data Corporation. Power brownout detector. 4,031,463, Cl. 324-77.00A.

Norberg, Gayle Russell, to Control Data Corporation. Line power distortion detector. 4,031,464, Cl. 324-78.00Z.

Norden Laboratories, Inc.: *See—*
Davis, Eldon, 4,031,204.

Nordnero AB: *See—*
Karlsson, Tom Orvar Bjorn, 4,030,521.

Norris, Elwood B.; and Yeakley, Lester M., to Electrical Power Research Institute. Biaxial capacitance strain transducer. 4,030,347, Cl. 73-88.50R.

Northern Electric Company Limited: *See—*
Copeland, Miles Alexander, 4,031,490.
Sencer, Mevhibe Gulay, 4,031,331.

Northern Illinois Gas Company: *See—*
Simciak, Walter, 4,031,513.

Northern Telecom Limited: *See—*
Ingrey, Sidney Ivor Joseph; Nentwich, Heinz Josef; and Poulsen, Robert Gordon, 4,030,967.

Northeved, Allan; Fabrin, Knud Christian Claus; and Solfjeld, Poul, to Akademiet for de tekniske Videnskaber, Svejsecentralen. Apparatus for recording an ultrasonic sectional view. 4,030,344, Cl. 73-67.80S.

Northeved, Allan: *See—*
Lund, Svend Aage; Northeved, Allan; Solfjeld, Poul; and Fabrin, Knud Christian Claus, 4,030,343.

Nose, Yukihiko, to Takeda Chemical Industries, Ltd. Combined dialyzer and adsorber unit. 4,031,010, Cl. 210-202.000.

Nottke, James E., to Du Pont de Nemours, E. I., and Company. Cyanoperfluoroether acid fluorides and their preparation. 4,031,124, Cl. 260-465.400.

Novak, Arne: *See—*
Colding, Bertil; Novak, Arne; Sandstrom, Unto; and Jakobsson, Goran, 4,031,368.

Novikov, Oleg Nikolaevich: *See—*
Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich, 4,030,339.

Nupla Corporation: *See—*
Carmien, Joseph Allen, 4,030,847.

Nutrilite Products, Inc.: *See—*
Westall, Edward B.; and Messing, Alan W., 4,031,260.

Nuttall, Judi. Cat litter dispensing container. 4,030,448, Cl. 119-1.000.

Nyquist, Stephen E.: *See—*
Swanson, James P.; and Nyquist, Stephen E., 4,030,391.

Nyssen, Adrianus Marinus; and Rauch, Gerhard Josef, to Ironside's Machine & Welding Ltd. Multiple roll recorrugator. 4,030,330, Cl. 72-105.000.

Oberbeck, George A., to Charles Stark Draper Laboratory, Inc., The. Saturable reactor current limiter. 4,031,457, Cl. 323-92.000.

Oberloier, John W., to Lyle Development, Inc. Tail flash removal apparatus. 4,030,650, Cl. 225-100.000.

O'Doherty, George O. P., to Eli Lilly and Company. Method for introducing amino groups into benzimidazole or imidazopyridine compounds. 4,031,107, Cl. 260-296.00H.

Oftedahl, Everett J. Bait bucket. 4,030,227, Cl. 43-56.000.

Ogawa, Yoshihisa; Inazaki, Tsunenori; and Kouda, Michihiro, to Nissan Chemical Industries, Ltd. Continuous process for preparing bromine. 4,031,194, Cl. 423-500.000.

Ogawa, Yutaka; and Hirai, Hiroshi, to Akebono Brake Industry Co., Ltd.; and Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Negative disc brake with a clearance-takeup mechanism. 4,030,577, Cl. 188-71.900.

Oger, Robert: *See—*
Baudoin, Jean-Claude; and Oger, Robert, 4,030,376.

Ogino, Masanori: *See—*
Saiki, Yukimi; Ogino, Masanori; and Watanabe, Shutoku, 4,031,547.

Ogle, James A.: *See—*
Holz, George E.; and Ogle, James A., 4,031,429.

Ogusu, Chihaya: *See—*
Nobutoki, Saburo; Ogusu, Chihaya; and Sugimoto, Masao, 4,031,551.

Ohhinata, Ichiro; and Okuhara, Shinzi, to Hitachi, Ltd. Memory circuit. 4,031,412, Cl. 307-238.000.

Ohhinata, Ichiro; Okuhara, Shinzi; and Takeshita, Tetsuo, to Hitachi, Ltd. Memory circuit. 4,031,413, Cl. 307-238.000.

Ohno, Isao: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,031,235.

Ohno, Nobuo: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,031,235.

Ohno, Tomeji: *See—*
Nakai, Tomotoshi; Utsumi, Kazuaki; and Ohno, Tomeji, 4,030,937.

Oka, Masaaki: *See—*
Yamamoto, Hiroshi; and Oka, Masaaki, 4,030,888.

Okamura, Akira: *See—*
Ando, Shizuo; and Okamura, Akira, 4,031,323.

Okamura, Yasushi; Tanaka, Kiichiro; and Takeda, Takashi, to Matsushita Electric Industrial Co., Ltd. Loudspeaker. 4,031,337, Cl. 179-115.50H.

Okuhara, Shinzi: *See—*
Ohhinata, Ichiro; and Okuhara, Shinzi, 4,031,412.
Ohhinata, Ichiro; Okuhara, Shinzi; and Takeshita, Tetsuo, 4,031,413.

Okuno, Yoshitoshi: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,031,235.

Olander, Stanley J.: *See—*
Holmen, Reynold E.; and Olander, Stanley J., 4,031,048.

Olashaw, William Francis, to General Electric Company. Insulative modular mounting panels for electrical switchboards. 4,031,433, Cl. 361-338.000.

Olasz, Joseph S.: *See—*
Fadl, Mohamed F. A.; and Olasz, Joseph S., 4,030,202.

Olin Corporation: *See—*
Ackerman, William R., Jr., 4,030,203.

Ollman, Melvin L. Building construction. 4,030,256, Cl. 52-90.000.

Olmstead, Michael M.: *See—*
Brooks, Norman B.; and Olmstead, Michael M., 4,030,622.

Olschewski, Armin: *See—*
Ernst, Horst M.; Olschewski, Armin; and Brandenstein, Manfred, 4,030,191.

Olympus Optical Co., Ltd.: *See—*
Ichikawa, Kazuo, 4,031,458.

Omori, Seita. Puncture alarm device for a tire. 4,031,508, Cl. 340-58.000.

Onishi, Makoto; Nagano, Katsuyuki; Tanaka, Toshiki P.; Matsuoka, Sadao; and Tanaka, Mitsuo, to Hitachi, Ltd. Optical connector. 4,030,809, Cl. 350-96.00C.

Ono Pharmaceutical Co., Ltd.: *See—*
Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Aishita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, 4,030,977.

Onsrud, Charles R. Tensioning device for a double drive profile cutter. 4,030,402, Cl. 90-19.000.

Oosterberg, Cedric Siegfried, to C. S. Oosterberg (Proprietary) Limited. Electric blanket. 4,031,352, Cl. 219-212.000.

Opedal, Torlak: *See—*
Einstabland, Tomas Berge; and Opedal, Torlak, 4,030,864.

Opi Cryochimie S.A.: *See—*
Vaesken, Maryvonne J.; Bultez, Alain E.; and Dalle, Jean-Paul, 4,030,883.

Opietnik, Walter: *See—*
Buzzi, Leo; Buzzi, Valentin; Opietnik, Walter; Liebl, Helmut; and Malobabic, Peter, 4,030,573.

Oppenlaender, Knut; Uhl, Guenter; Helfert, Herbert; Scharpenberg, Hans-Georg; and Stork, Karl, to BASF Aktiengesellschaft. Cyclic acetals. 4,031,112, Cl. 260-340.700.

Orkwiszewski, Wayne L.: *See—*
Boetto, Charles; Orkwiszewski, Wayne L.; and Connor, Donald E., 4,030,551.

Osborn, David R. Bottled water transfer device. 4,030,634, Cl. 222-23.000.

Osiko, Vyacheslav Vasilievich: *See—*
Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tatarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,030,891.

Otaka, Syoichi: *See—*
Tanaka, Minoru; and Otaka, Syoichi, 4,030,460.

Otozai, Kiyoteru: *See—*
Morita, Masato; Morita, Reiko; and Otozai, Kiyoteru, 4,031,388.

Otter, Marinus J.A.M. Den; Nijenhuis, Anne Te; and Van Geenen, Albert A., to Stamicarbon B.V. Polyurethanes prepared from hydroxymethyl isocyanurates. 4,031,040, Cl. 260-2.5AW.

Ours, Carroll Wayne: *See—*
Jones, Peter Hadley; Ours, Carroll Wayne; and Kyncl, Jaroslav, 4,031,242.

Outboard Marine Corporation: *See—*
Betts, E. Douglas, 4,030,470.

Outokumpu Oy: *See—*
Aaltonen, Olavi August; Andersson, Bengt Torsten; Juusela, Jyrki Tapani; Palperi, Matti Johannes; and Tuominen, Tapio Kalevi, 4,030,915.

Owens, Gary D., to Texaco Inc. Seismic system with signal-to-noise determination. 4,031,505, Cl. 340-15.5DP.

Owens-Illinois, Inc.: *See—*
Thomas, Ian M., 4,030,938.

Ozaki, Tadashi: *See—*
Yamaguchi, Shunzo; Ozaki, Tadashi; and Konomi, Toshiaki, 4,030,464.

Ozawa, Juichiro. Fusible resistor. 4,031,497, Cl. 338-308.000.

Ozawa, Juichiro: *See—*
Miwa, Takeshi, 4,030,408.

Ozawa, Jun: *See—*
Isikawa, Tosio; Ozawa, Jun; and Kikuchi, Takehiro, 4,031,347.

Pacific Technology, Inc.: *See—*
Leyde, Warren L.; and Marker, Delbert E., 4,031,406.

Pacific Utilities Supply Co.: *See—*
Grannis, Roland K., 4,030,854.

Pacifico, Antonio: *See*—
Rescalli, Carlo; and Pacifico, Antonio, 4,031,157.
Package Exhibit Programs, Inc.: *See*—
Donovan, John E., 4,030,219.
Packaging Corporation of America: *See*—
Hildebrand, Larry R.; and Carpenter, John F., 4,030,604.
Paffoni, Camillo: *See*—
Pieri, Giampiero; Carlini, Filippo Maria; Paffoni, Camillo; and Boffa, Gioacchino, 4,031,096.
Page, Joe W., Jr.: *See*—
Fisher, Lloyd R., 4,030,150.
Palais, Conrad: *See*—
Giraud, Pierre; Palais, Conrad; and Rapkin, Edward, 4,031,392.
Palladino, Gaetano, to Lark S.p.A. 16-Alpha-methyl-17 alpha-bromo-1,4-pregnadiene-21-ol-3,20-dione-derivatives. 4,031,080, Cl. 260-239.55R.
Palmer, Dale A., to Monroe Auto Equipment Company. Vehicle suspension device. 4,030,713, Cl. 267-8.00R.
Palperi, Matti Johannes: *See*—
Aaltonen, Olavi August; Andersson, Bengt Torsten; Juusela, Jyrki Tapani; Palperi, Matti Johannes; and Tuominen, Tapio Kalevi, 4,030,915.
Paoli, Alfred, to Akzona Incorporated. Electrical connector with means for maintaining a connected condition. 4,030,798, Cl. 339-89.00R.
Papafingos, Pandelis N.; and Lance, Richard T., to Alumax Mill Products, Inc. Method of treating aluminum drosses, skims and slags. 4,030,914, Cl. 75-68.00R.
Papantoniou, Christos; and Gaetani, Quintino, to Societe Anonyme dite: L'Oreal. Hair lacquer or setting lotion containing bi- or tri-sequenced copolymer. 4,030,512, Cl. 132-7.000.
Paranjpe, Suresh C., to Mead Corporation, The. Startup apparatus and method for jet drop recording with relatively movable charge plate and orifice plate. 4,031,561, Cl. 346-1.000.
Paranjpe, Suresh C.; and Moore, Daniel W., to Mead Corporation, The. Jet drop recording head having an improved porous deflection ribbon. 4,031,563, Cl. 346-75.000.
Parent, Guy, to Compagnie Industrielle des Telecommunications Cit-Alcatel SA. Position measuring device. 4,031,500, Cl. 340-6.00R.
Parfenov, Anatoly Ivanovich: *See*—
Shults, Mikhail Mikhailovich; Parfenov, Anatoly Ivanovich; Shnypikov, Alexandr Dmitrievich; Krunchak, Vladimir Georgievich; Evnina, Sarra Borisovna; Dolidze, Vladimir Alexandrovich; and Tarasova, Valentina Mikhailovna, 4,030,935.
Parikh, Bipin D.: *See*—
McClain, Herbert D.; Parikh, Bipin D.; and Burkey, John K., 4,031,317.
Parish, Harold Cheney; Allard, Michael Duane; Pettit, Jack Leland; and Spulgis, Ivars Sigurds, to Pennwalt Corporation. Charcoal adsorber filter fill system. 4,030,639, Cl. 222-189.000.
Parke, Davis & Company: *See*—
Campbell, Alfred, 4,031,072.
Fleming, Robert Willerton, 4,031,101.
Nicolaides, Ernest D.; Tinney, Francis John; and French, James Clark, 4,031,069.
Tinney, Francis John, 4,031,070.
Wittle, Eugene Leroy; and Nicolaides, Ernest D., 4,031,071.
Parlette, Marvin D., Jr.: *See*—
Walters, William T.; and Parlette, Marvin D., Jr., 4,030,493.
Parmann, Gunnar, to Rieber & Son Plastic-Industri A/S. Combined mould element and sealing ring. 4,030,872, Cl. 425-393.000.
Parquet, Donald J.; and Pedersen, Carl O., to J. I. Case Company. Hydraulic skid steering control system. 4,030,560, Cl. 180-6.480.
Parrish, Thomas D. Friction or inertia welding apparatus. 4,030,658, Cl. 228-2.000.
Partyka, Richard Anthony: *See*—
Juby, Peter Frederick; and Partyka, Richard Anthony, 4,031,093.
Pascale, John V.: *See*—
Wilson, Richard A.; Pascale, John V.; and Vock, Manfred Hugo, 4,031,257.
Pasquan, Raymond F. Switching system for guided vehicles. 4,030,422, Cl. 104-131.000.
Pass-Port Systems, Inc.: *See*—
Brooks, Norman B.; and Olmstead, Michael M., 4,030,622.
Pastorel, Robert J., to Appleton Electric Company. Defeater for mechanical safety interlock for covers of explosion-proof electrical housing. 4,031,340, Cl. 200-50.00A.
Patchornik, Abraham: *See*—
Haviv, Fortuna; Patchornik, Abraham; and Altman, Janina, 4,031,083.
Patel, Bhupendra C.: *See*—
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,030,497.
Patel, Mahesh S., to Eutectic Corporation. High hardness flame spray nickel-base alloy coating material. 4,031,278, Cl. 427-423.000.
Patel, Piyush J.; and Miringoff, William, to Tenneco Chemicals, Inc. Process for the removal of vinyl chloride from latexes containing polyvinyl chloride. 4,031,056, Cl. 260-29.6PT.
Patelli, Bianca; Bernardi, Luigi; Arcamone, Federico; and di Marco, Aurelio, to Societa' Farmaceutici Italia S.p.A. Adriamycin esters, their preparation and use. 4,031,211, Cl. 424-180.000.
Patrick, Ernest H. Air conditioner. 4,030,313, Cl. 62-7.000.
Patton, Charles Richard: *See*—
Hanauer, Burton C.; and Patton, Charles Richard, 4,030,690.
Patzer, Michael D., to Valleylab, Inc. Electrical connector. 4,030,796, Cl. 339-61.00R.
Paul, Roger, to Etablissement Ani, chez Me Beck, avocat. Process for preparing a product having a biological activity. 4,030,976, Cl. 195-29.000.
Pavlov, Vyacheslav Valentinovich: *See*—
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.
Payakov, Stefan Georgiev: *See*—
Kochemidov, Atanas Dimitrov; Makedonski, Boris Georgiev; Dumanov, Ivan Minkov; Payakov, Stefan Georgiev; Galabov, Peter Konstantinov; and Atanassov, Haralampi Aangelov, 4,030,249.
Payne, Richard, to Thurne Engineering Company Limited. Packaging machine. 4,030,268, Cl. 53-55.000.
Pearne, Florentin J.: *See*—
Kelley, Norman S.; and Pearne, Florentin J., 4,030,618.
Pedersen, Carl O.: *See*—
Parquet, Donald J.; and Pedersen, Carl O., 4,030,560.
Pedersen, Charles John; and Bromels, Marilyn H., to Du Pont de Nemours, E. I., and Company. Macrocyclic hetero imine complexing agents. 4,031,111, Cl. 260-340.300.
Pedlar, Roy; Spencer, Alan Roderick; and Edwards, Colin, to British Aircraft Corporation Limited. Vehicles of the submersible type. 4,030,434, Cl. 114-16.00R.
Peil, William, to General Electric Company. Semiconductor amplification means combining two cascaded transistor amplifiers of high inverse impedances. 4,031,416, Cl. 307-299.00A.
Pellarini, Luigi. Aircraft structures. 4,030,688, Cl. 244-13.000.
Pelletier, Herve Joseph. Stand for a roll of floor covering material. 4,030,679, Cl. 242-68.000.
Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 5-[5-(4-Chlorophenyl)-2-furanyl]dihydro-2(3H)-furanone. 4,031,113, Cl. 260-343.600.
Pelzer, Rudolf; and Scholl, Heinz, to Saint-Gobain Industries. Degassing of liquids. 4,030,897, Cl. 55-42.000.
Pelzer, Rudolf: *See*—
Straeten, Franz-Josef; Pelzer, Rudolf; Feiten, Karl-Josef; and Stevens, Wilhelm-Josef, 4,030,961.
Penfold, Alan S.; and Thornton, John A., to Telic Corporation. Electrode type glow discharge method and apparatus. 4,030,996, Cl. 204-192.00R.
Penfold, Alan S.; and Thornton, John A., to Telic Corporation. Electrode type glow discharge apparatus. 4,031,424, Cl. 313-146.000.
Peng, Luke Shih-Cheng; and Yu, Herbert Chia-Chen. Structures for folding baby-carriages, chairs, and the like. 4,030,769, Cl. 280-42.000.
Penland Container, Inc.: *See*—
Yealy, Carl F., 4,030,630.
Pennwalt Corporation: *See*—
Parish, Harold Cheney; Allard, Michael Duane; Pettit, Jack Leland; and Spulgis, Ivars Sigurds, 4,030,639.
Pentney, Harry, to Gillette Company, The. Dispensing container for razor blade units. 4,030,598, Cl. 206-356.000.
Perron, Robert Richard; and Trombly, John E., to Eastern Company, The. Keyhole-less electronic lock. 4,031,434, Cl. 361-172.000.
Perry, Joseph P.: *See*—
Luce, Robert L.; Perry, Joseph P.; and Sansburry, James D., 4,030,952.
Peters, Daniel Vern, to Bell Telephone Laboratories, Incorporated. Filter capacitor charging circuit. 4,031,559, Cl. 361-52.000.
Peterson, Marvin A.: *See*—
Kasik, Robert L.; and Peterson, Marvin A., 4,031,254.
Peterson, Reuben E. Material sensing switch. 4,031,342, Cl. 200-61.210.
Petrenko, Anatoly Avramovich: *See*—
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.
Petretti, Raymond H., to Toneray Covers, Inc. Cover assembly. 4,030,780, Cl. 296-100.000.
Petrusek, Victor. Magnetic target throwing game. 4,030,736, Cl. 273-95.00R.
Pettit, Charles E. Locking gas cap system. 4,030,322, Cl. 70-159.000.
Pettit, Jack Leland: *See*—
Parish, Harold Cheney; Allard, Michael Duane; Pettit, Jack Leland; and Spulgis, Ivars Sigurds, 4,030,639.
Pfizer Inc.: *See*—
Barth, Wayne E., 4,031,077.
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,031,206.
Kadin, Saul B.; and Moore, Peter F., 4,031,217.
Nakanishi, Susumu, 4,031,108.

Pfleiderer, Hans-Joerg, to Siemens Aktiengesellschaft. Solid body image sensor having charge coupled semiconductor charge shift elements and method of operation. 4,031,315, Cl. 358-212.000.

Philip, Morris. Dial and cylinder connection. 4,030,318, Cl. 66-28.000.

Philipoff, Alexandros. Universally adjustable vise stop. 4,030,718, Cl. 269-315.000.

Phillips, James W.; and Troyer, Terrance J., to Dwyer Instruments, Inc. Differential pressure gauge. 4,030,365, Cl. 73-393.000.

Phillips, Jodie W., to Corning Glass Works. Pin handling and insertion mechanism. 4,030,173, Cl. 29-25.190.

Phillips, Lawrence W.; and Rodgers, Harris G., Sr., to Corning Glass Works. Pin feeding mechanism. 4,030,181, Cl. 29-809.000.

Phillips Petroleum Company: *See—*
Gunnell, Thomas J., 4,030,889.
Haskell, Donald M., 4,031,153.
McKay, Dwight L., 4,031,002.
Morrison, Charles B., 4,030,642.

Phillips, Raymond J. Miniature impact tool. 4,030,556, Cl. 173-120.000.

Picker Corporation: *See—*
Hunt, Robert P.; and Steffek, Robert J., 4,031,400.

Picker X-Ray Mfg. Limited: *See—*
Sell, Leslie James, 4,030,579.

Pickert, Hansjurgen; Sesselmann, Hans Dieter; and Timmers, Leonardes August, to William Prym-Werke KG. Apparatus for sewing slide fasteners to elastic carriers. 4,030,430, Cl. 112-121.260.

Pieri, Giampiero; Carlini, Filippo Maria; Paffoni, Camillo; and Boffa, Gioacchino, to Montedison S.p.A. Fluorescent azabenzanthronic dyes. 4,031,096, Cl. 260-272.000.

Pierson, Mark V. Longitudinally fed component insertion apparatus. 4,030,180, Cl. 29-741.000.

Piesch, Steffen: *See—*
Schnee, Karl; Tichy, Dieter; and Piesch, Steffen, 4,031,064.

Pilarski, Regis Victor; and Rumpf, Robert John, to Firestone Tire & Rubber Company, The. Integral hinge sensing switch. 4,031,344, Cl. 200-61.58B.

Pilarski, Regis Victor: *See—*
Johnson, Melvin Kermit; and Pilarski, Regis Victor, 4,030,648.

Pilkington P-E Limited: *See—*
Rogers, Philip John, 4,030,805.

Pilkington, Ted S.; and Castle, Henry H. Toilet seat lifting apparatus including a resilient bowed member for preventing the seat from slamming. 4,030,146, Cl. 4-251.000.

Pillsbury Company, The: *See—*
Durst, Jack R., 4,031,261.

Pines, Seemon H.; and Kozlowski, Matthew A., to Merck & Co., Inc. Preparation of 3-hydroxymethyl-7β-aminoadipoyl-7α-methoxy-3-cephem-4-carboxylic acid. 4,031,085, Cl. 260-243.00C.

Pingon, Pierre Joseph. Pneumatic vehicle jack. 4,030,701, Cl. 254-124.000.

Pioneer Electric and Research Corporation, The: *See—*
Krause, Ernest Harry; Seaman, Wesley Arthur; and Angelopoulos, Peter Gregory, 4,031,466.

Pioneer Electronic Corporation: *See—*
Ando, Shizuo; and Okamura, Akira, 4,031,323.
Itagaki, Tadasi, 4,030,564.

Piret, Jean: *See—*
Lalin, Andre; and Piret, Jean, 4,030,381.

Piret, Norbert L.; Rabben, Hans Joachim; Kudelka, Herbert; and Schmidt, Siegbert, to Duisburger Kupferhutte. Process for recovering electrolytic copper of high purity by means of reduction electrolysis. 4,030,990, Cl. 204-108.000.

Pitney-Bowes, Inc.: *See—*
Dlugos, Daniel F.; and Manduley, Flavio M., 4,031,402.
Irvine, Robert; and Luperti, Harry E., 4,030,722.
Irvine, Robert; and Luperti, Harry E., 4,030,723.

Pitre, Lester M., to Innovative Electronics, Inc. High fidelity loudspeaker system. 4,031,318, Cl. 179-1.00D.

Pitroda, Satyan G., to GTE Automatic Electric Laboratories Incorporated. Conferencing arrangement for use in a PCM system. 4,031,328, Cl. 179-18.0BC.

Pittet, Alan O.: *See—*
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,031,140.

Plate Bonn Gesellschaft mit beschrankter Haftung: *See—*
Raabe, Fritz; and de Jong, Eduard, 4,030,957.

Plessey Handel und Investments A.G.: *See—*
Thorniley, Brian Robert, 4,031,358.

Pletzke, Thomas S.: *See—*
Espino, Ramon L.; and Pletzke, Thomas S., 4,031,123.

Plotnick, Richard J.: *See—*
Martz, Lyle F.; and Plotnick, Richard J., 4,031,404.

Pocci, Nedo Igor: *See—*
Hahm, Heinz Gunter; and Pocci, Nedo Igor, 4,030,185.

Poe, Curtis Eugene; and Cheers, Ronald Murray, to Ingersoll-Rand Company. Drill string make-up and break-out mechanism. 4,030,542, Cl. 166-77.500.

Poetzsch, Rolf; and Schuster, Hans Gunther, to Albrecht Baumer KG Spezialmaschinenfabrik. Twin-edged foam plastic cleaving machine. 4,030,386, Cl. 83-4.000.

Pohler, Heinz: *See—*
Schluter, Wilhelm; and Pohler, Heinz, 4,030,786.

Pokorny, Svatopluk: *See—*
Kalal, Jaroslav; Coupek, Jiri; Pokorny, Svatopluk; Svec, Frantisek; and Bouchal, Karel, 4,031,037.

Polette, Melvin L. Internal combustion engine device. 4,030,461, Cl. 123-119.00B.

Poli, Albert A.; Bossart, Clayton J.; and Benzie, Thomas P., to Mine Safety Appliances Company. Carbon monoxide detection apparatus and method. 4,030,887, Cl. 23-232.00E.

Polin, Antonio, to Ing. Polin & C di Polin Ing. Antonio & C. S.a.s. Dough transfer apparatus. 4,030,594, Cl. 198-489.000.

Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich. Machine for high-speed plastic working of materials. 4,030,389, Cl. 83-513.000.

Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna. [Perfluoroalkyl(alkoxy)phenyl]methyldichlorosilanes and method of preparing same. 4,031,119, Cl. 260-448.20B.

Poppelreiter, Joseph C., II, to Kubik Hydradrives, Inc. Electronic position and velocity control system. 4,031,442, Cl. 318-561.000.

Porinchak, Joseph F.: *See—*
Brax, Harri J.; Porinchak, Joseph F.; and Weinberg, Alan S., 4,031,162.

Porsche AG: *See—*
Bier, Manfred, 4,030,350.

Port, Beverly A. Convertible doll with pivoted changeable hands. 4,030,240, Cl. 46-153.000.

Portmann, Hubert, to Ebauches S.A. Control device for an electronic wrist watch. 4,030,284, Cl. 58-23.00R.

Possati, Mario; and Danieili, Franco, to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C. Method and relevant apparatus for detecting the geometrical features of mechanical workpieces, in particular for measuring the eccentricity and out-of-roundness. 4,030,201, Cl. 33-174.00Q.

Potoroka, Victor W. Clothes hanger carrier. 4,030,649, Cl. 224-45.00T.

Potter, Robert Lawrence: *See—*
Dudonis, Ronald Michael; Morrison, Charles Glenn; Potter, Robert Lawrence; and Streisand, Kenneth, 4,031,325.

Poujois, Robert: *See—*
Audaire, Luc; Borel, Joseph; Le Goascoz, Vincent; and Poujois, Robert, 4,031,380.

Poulsen, Robert Gordon: *See—*
Ingrey, Sidney Ivor Joseph; Nentwich, Heinz Josef; and Poulsen, Robert Gordon, 4,030,967.

Powanda, Thomas M.: *See—*
Bunkley, Rex L.; and Powanda, Thomas M., 4,031,053.

Powell, James E., to Shell Oil Company. 3,4,7,8-Tetrahydro-9-nitro-7-substituted-2H,6H-pyrimido-(4,3-b)(1,3)thiazines. 4,031,087, Cl. 260-243.00R.

PPG Industries, Inc.: *See—*
Anderson, Carl Clement; and Dowbenko, Rostyslaw, 4,031,290.
Cooper, Joseph E., 4,031,175.
Dowbenko, Rostyslaw; and Marchetti, Joseph R., 4,031,051.
Hawkins, Charles T., 4,030,905.
Jerabek, Robert D., 4,031,050.
Manner, James A., 4,031,126.

Pratt Manufacturing Corporation: *See—*
Pratt, Robert H., 4,030,960.

Pratt, Robert H., to Pratt Manufacturing Corporation. Pneumatic sealing wheel. 4,030,960, Cl. 156-555.000.

Preiner, Gerald: *See—*
Linck, Donald W., II; and Kaprelian, George, 4,030,197.

Presley, Kenneth Dale: *See—*
Krause, Donald Lester; and Presley, Kenneth Dale, 4,030,923.

Price, Donald C. Sports watercraft. 4,030,443, Cl. 115-70.000.

Price, Ralph E., to Landis Tool Company. Workpiece transporting structure for use with a cylindrical grinder. 4,030,252, Cl. 51-215.00R.

Pringle, William L., to United States Steel Corporation. Disc brake assembly including a self-contained actuator with wear take-up and anti-drag device. 4,030,576, Cl. 188-71.800.

Pro-Tec Industries: *See—*
Hill, John C., 4,030,775.

Prochazka, Svante: *See—*
Johnson, Curtis A.; and Prochazka, Svante, 4,031,178.

Procter & Gamble Company, The: *See—*
Laughlin, Robert Gene; and Gougeon, Thomas William, 4,031,202.

Proctor and Associates Company: *See—*
Proctor, Daryl F., 4,031,432.

Proctor, Daryl F., to Proctor and Associates Company. Solid state switching circuit and method for simulating a relay. 4,031,432, Cl. 361-7.000.

Production Specialties, Inc.: *See—*
McGinn, Ferdinand M., 4,030,543.

Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation.

Organosilicone polymers and polyester urethane foam produced therewith. 4,031,042, Cl. 260-2.5AH.
Provost, Philip J.; Ittensohn, Oswald L.; and Hilleman, Maurice R., to Merck & Co., Inc. Hepatitis A antigen. 4,031,203, Cl. 424-89.000.
Pryor, David Ernest: *See—*
Forsyth, Bruce Adam; Pryor, David Ernest; McGarry, Errol James; and Harney, Donald William Gerald, 4,031,249.
Pullukat, Thomas J., to Chemplex Company. Polymerization catalyst and method. 4,031,298, Cl. 526-113.000.
Puryear, John W., to Brunswick Corporation. Crossbow trigger. 4,030,473, Cl. 124-35.00R.
Putz, A. Frank. Variable displacement rotary piston expansible chamber device. 4,030,861, Cl. 418-27.000.
Pyle, Kenneth E., to Reef-Baker Corporation. Condensate valve assembly. 4,030,517, Cl. 137-203.000.
Quadrelax Corporation: *See—*
McEachran, Dennis B., 4,030,487.
Quigley, Peter James Calvert. Dice game. 4,030,763, Cl. 273-134.00D.
Quist, Donald G.: *See—*
Thomas, Virgil E., Jr.; and Quist, Donald G., 4,031,479.
Quivy, Michel: *See—*
Cluzel, Philippe; Quivy, Michel; and Tocquet, Bernard, 4,031,418.
Quivy, Michel Georges: *See—*
Lefaudeux, Francois L. M.; and Quivy, Michel Georges, 4,031,502.
R. R. Donnelley & Sons Company: *See—*
Swanson, Kermit E.; and Kuzel, Frank J., 4,030,621.
Raabe, Fritz; and de Jong, Eduard, to Plate Bonn Gesellschaft mit beschrankter Haftung. Copolyamides containing caprolactam, lauriclactam and hexamethylene diamine adipate. 4,030,957, Cl. 156-331.000.
Rabben, Hans Joachim: *See—*
Piret, Norbert L.; Rabben, Hans Joachim; Kudelka, Herbert; and Schmidt, Siegbert, 4,030,990.
Rabenseifner, Karl, to Volkswagenwerk Aktiengesellschaft. Vehicle suspension system. 4,030,777, Cl. 280-714.000.
Rabenstein, Heinrich: *See—*
Voss, Ernst; and Rabenstein, Heinrich, 4,031,293.
Rada, Joseph J.; and Gardner, Jeffrey M., to Container Corporation of America. Partition arrangement. 4,030,660, Cl. 229-42.000.
Radiochemical Centre Limited, The: *See—*
Bayly, Russell James; Chambers, Virginia Edith May; and Monks, Reginald, 4,030,886.
Raether, Wolfgang: *See—*
Winkelmann, Erhardt; and Raether, Wolfgang, 4,031,232.
Rafferty, Andrew J., to Brown & Root, Inc. Method and apparatus for adjustably supporting a pipeline relative to a lay vessel. 4,030,311, Cl. 61-108.000.
Raggiotti, Guglielmo; and Colonnelli, Domenico, to Itus Patent Holding (IPH) N.V. Temperature monitoring and display system. 4,031,365, Cl. 235-151.300.
Raider, Jerry Wesley: *See—*
Martin, Blair Robertson; Meier, Johann Hans; and Raider, Jerry Wesley, 4,030,591.
Rambousek, Miroslav; Kapl, Ladislav; and Mladek, Milos, to Elitex, Zavody textilniho strojirenstvi, generalni reditalstvi. High-speed spindle holder suspension for open-end spinning machines. 4,030,279, Cl. 57-58.890.
Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Hindered piperidine carboxylic acids, metals salts thereof and stabilized compositions. 4,031,095, Cl. 260-270.00C.
Ramirez, Ernest R.; and Johnson, Dennis L., to Swift and Company Limited. Vortex coagulation means and method for wastewater clarification. 4,031,006, Cl. 210-44.000.
Ramsey, Harold Eugene, to Du Pont de Nemours, E. I., and Company. Film severing method and apparatus. 4,030,388, Cl. 83-49.000.
Rando, Joseph F.; Sobel, Arthur; and Davidson, Richard W., to Spectra-Physics, Inc. Automatic grade rod and method of operation. 4,030,832, Cl. 356-152.000.
Rank Xerox Ltd.: *See—*
Fukui, Kiyoshige; Tamamura, Akira; and Nishimoto, Minoru, 4,030,725.
Kurosaki, Takefumi, 4,030,721.
Rannou, Jean, to Thomson-CSF. Reciprocal microwave junction device. 4,031,487, Cl. 333-1.000.
Rao, Pemmaraju Narasimha, to Becton, Dickinson and Company. Testosterone derivatives. 4,031,117, Cl. 260-397.100.
Rapkin, Edward: *See—*
Giraud, Pierre; Palais, Conrad; and Rapkin, Edward, 4,031,392.
Rapp, Guenther; Fuchs, Hugo; and Thomas, Erwin, to BASF Aktiengesellschaft. Manufacture of cyclohexanone oxime. 4,031,139, Cl. 260-566.00A.
Raschack, Manfred: *See—*
Cyrus, Richard; and Raschack, Manfred, 4,031,216.
Rasor, William A.; Van Dine, Walter S.; and Whitney, Frank A., to Masco Corporation. Vehicle accessory rack. 4,030,647, Cl. 224-29.00R.
Rast, Robert Morgan; Wine, Charles Martin; and Henderson, John Goodchilde Norie, to RCA Corporation. Television tuning system with provisions for receiving RF carrier at nonstandard frequency. 4,031,549, Cl. 358-193.000.
Rauch, Gerhard Josef: *See—*
Nyssen, Adrianus Marinus; and Rauch, Gerhard Josef, 4,030,330.
Rauch, Moriz V.: *See—*
Muller, Karl-Heinz; Rindfleisch, Volker; Rauch, Moriz V.; and Willasch, Dieter, 4,031,390.
Raulf, Erich: *See—*
Gemmeke, Wilfried; Werner, Heinrich; Echterhoff, Heinz; and Raulf, Erich, 4,031,189.
Raymond Lee Organization, Inc., The: *See—*
Bobka, George R., 4,030,751.
Hawryluk, Peter, 4,030,457.
Soule, Gustave H., Jr., 4,031,360.
Stanislawczyk, John P., 4,030,323.
Raymond, Paul J., to A. J. Harris & Sons, Inc. Bridge expansion joint. 4,030,156, Cl. 14-16.500.
Raynaud, Guy M.: *See—*
Fauran, Claude P.; Bourgery, Guy R.; Raynaud, Guy M.; and Dorme, Nicole A. M., 4,031,089.
RCA Corporation: *See—*
Andrevski, Zygmunt M.; and Lurie, Michael Jay, 4,030,815.
Aronson, Albert Irving, 4,030,316.
Crane, Robert Anthony; and Ghosh, Asoke Kumar, 4,031,485.
Crowle, Brian, 4,031,495.
Firester, Arthur Herbert; and Gorog, Istvan, 4,030,835.
Goldberg, Edwin Allen, 4,031,476.
Leedom, Marvin Allan, 4,031,546.
Rast, Robert Morgan; Wine, Charles Martin; and Henderson, John Goodchilde Norie, 4,031,549.
Scheffer, Harvey Dow Gibson, 4,030,657.
Stanley, Thomas Osborne, 4,031,427.
Sterner, John Franklin, 4,031,465.
Woodward, Oakley McDonald, 4,031,539.
Reach Electronics, Inc.: *See—*
Ziebell, Donald O.; and Longly, James M., 4,031,468.
Reader, Arthur M., to Celanese Corporation. Polyurethane-amide resins based upon isocyanate terminated prepolymers of bis-(2-hydroxyethyl)terephthalate. 4,031,035, Cl. 260-2.5AM.
Reber, Erwin; and Schollhorn, Fritz, to Josef Bautz GmbH. Agricultural machine. 4,030,274, Cl. 56-13.500.
Recker, Gary B., to Rockwell International Corporation. Optical transducer encoding apparatus. 4,031,386, Cl. 250-230.000.
Redman, Charles M., to United States of America, Army. Thermal image camera. 4,031,393, Cl. 250-332.000.
Redwine, Donald J.; and Kitagawa, Norishisa, to Texas Instruments Incorporated. Address buffer circuit for semiconductor memory. 4,031,415, Cl. 307-279.000.
Reece, Paul: *See—*
Armor, Anthony F.; Chari, Madabushi V. K.; Kudlacik, Henry W.; and Reece, Paul, 4,031,422.
Reed, John Anthony; and Karp, Joel Allen, to Burroughs Corporation. Ultra high sensitivity sense amplifier for memories employing single transistor cells. 4,031,522, Cl. 340-173.00R.
Reed, Terry J., to Westinghouse Electric Corporation. System and method employing a digital computer with improved programmed operation for automatically synchronizing a gas turbine or other electric power plant generator with a power system. 4,031,407, Cl. 307-87.000.
Reef-Baker Corporation: *See—*
Pyle, Kenneth E., 4,030,517.
Reesman, Stanley H.: *See—*
Berry, Martin F.; Reesman, Stanley H.; Smith, Marvin L.; and Middlesworth, Peter Van, 4,031,267.
Regber, Norman; Dukic, Ferdinando V.; and Diorio, Frank, to United States of America, Army. Gravity deployed mine with combined upper clearing charge firing and delayed main charge initiation. 4,030,418, Cl. 102-8.000.
Regie Nationale des Usines Renault: *See—*
Colinet, Andre, 4,030,379.
Lalin, Andre; and Piret, Jean, 4,030,381.
Reichstein, Erik Laurits, to Arenco AB. Cutter for removing a tough surface layer from pieces of material. 4,030,163, Cl. 17-50.000.
Reid, Joanne; de la Teja, Elpidio Leoncio; and Farrell, Francis, to Thomas J. Lipton, Inc. Process for preparing instant beverage cubes. 4,031,238, Cl. 426-285.000.
Reif, Robert Bruce, to Hoffmann-La Roche Inc. Manufacture of pharmaceutical unit dosage forms. 4,031,200, Cl. 424-27.000.
Reiland, Dennis J., to General Pattern Co., Inc. Method of making shaker plates. 4,030,188, Cl. 29-527.100.
Reilly, David M.: *See—*
Heilman, Marlin S.; Langer, Alois A.; Mirowski, Mieczyslaw; Mower, Morton M.; and Reilly, David M., 4,030,509.
Reiner, Carl Casper, to Deere & Company. Source related potential indicating continuity tester. 4,031,461, Cl. 324-51.000.
Reinert, Gerhard; Fallows, Jack; and Dussy, Paul, to Ciba-Geigy Corporation. Continuous process for optical brightening. 4,031,273, Cl. 427-158.000.
Reinhall, Rolf Bertil: *See—*
Asplund, Arne Johan Arthur; Reinhall, Rolf Bertil; and Ahrel, Per Johan Ingemar, 4,030,969.
Reisinger, Konrad; and Holzl, Ludwig, to Siemens Aktiengesellschaft. Apparatus for the time division multiplex transmission of binary signals. 4,031,316, Cl. 178-50.000.
Remy, David C., to Merck & Co., Inc. Trifluoromethylthio (and sulfonyl) derivatives of cyproheptadine analogs. 4,031,222, Cl. 424-267.000.
Remy, David C., to Merck & Co., Inc. Trifluoromethylthio derivatives of cyproheptadine. 4,031,223, Cl. 424-267.000.
Renner, Gunter; Boie, Immo; and Scheben, Quirin, to AGFA-Gevaert, A.G. Aliphatic β-keto esters. 4,031,130, Cl. 260-468.00K.
Rescalli, Carlo; and Pacifico, Antonio, to Snam Progetti S.p.A. Method for removing acetylenic compounds from saturated, olefinic and

dienic hydrocarbons or mixtures thereof. 4,031,157, Cl. 260-676.00R.
Research Corporation: *See—*
Callis, James B.; and Davidson, Ernest R., 4,031,398.
Reuschel, Donald L.; and Hendry, James W., to Ex-Cell-O Corporation. Intensified cylinder assembly. 4,030,299, Cl. 60-560.000.
Revenko, Olga Mikhailovna: *See—*
Khcheyan, Khachik Egorovich; Revenko, Olga Mikhailovna; Shatalova, Alla Nikolaevna; Gelperina, Eleonora Grigorievna; Agrinskaya, Lidia Ivanovna; and Muradian, Georgy Avanesovich, 4,031,128.
Reyhing, Jorg: *See—*
Wimber, Hans; Rohde, Wilhelm; and Reyhing, Jorg, 4,030,896.
Reynolds Metals Company: *See—*
Farquhar, Melville T., 4,030,661.
Rhone-Poulenc Industries: *See—*
Bouy, Pierre; Juillard, Michel; and Bourgeois, Jean-Luc, 4,031,041.
Helgorsky, Jacques, 4,031,148.
Rice, Jeffrey C.; and Tucker, Terry A., to Sperry Rand Corporation. Synchro-to-digital converter. 4,031,531, Cl. 340-347.0SY.
Richards, William Henry George, to Burroughs Wellcome Co. Method for the treatment of malaria. 4,031,220, Cl. 424-258.000.
Richardson, Edwin A.; and Scheuerman, Ronald F., to Shell Oil Company. Economically dissolving barium sulfate scale with a chelating agent. 4,030,548, Cl. 166-279.000.
Richev, Georgi Trendafilov: *See—*
Arolski, Angel Tomov; Usheva, Velichka Borissova; Gruev, Peter Vassilev; Richev, Georgi Trendafilov; and Doncheva, Zvetana Semkova, 4,031,264.
Richter, Hans, to Keller & Knappich Augsburg Zweigneiderlassung der Industrie-Werke Karlsruhe Augsburg Aktienegesellschaft. Robot device. 4,030,617, Cl. 214-1.0CM.
Rickert, Glenn Edward. Frequency selective reflex sight. 4,030,839, Cl. 356-251.000.
Rickmann, Bernard C.: *See—*
Rozenboom, Gustave; and Rickmann, Bernard C., 4,030,794.
Rieber & Son Plastic-Industri A/S: *See—*
Parmann, Gunnar, 4,030,872.
Riedel, Dieter, to Drabert Sohne. Decatizing of fabrics. 4,030,320, Cl. 68-5.00R.
Rieter Machine Works, Ltd.: *See—*
Hablutzel, Kurt; and Lamparter, Hansruedi, 4,030,635.
Rigazio, Anthony W., to General Time Corporation. Combination housing with compartment and ejector mechanism for ejecting a battery therefrom. 4,031,295, Cl. 429-100.000.
Rinaldi, Gerald Michael: *See—*
Giles, Thomas Clyde; Kohout, Otto James; and Rinaldi, Gerald Michael, 4,031,414.
Rindfleisch, Volker: *See—*
Muller, Karl-Heinz; Rindfleisch, Volker; Rauch, Moriz V.; and Willasch, Dieter, 4,031,390.
Rittler, Hermann L., to Corning Glass Works. Exuded transition metal films on glass-ceramic articles. 4,030,903, Cl. 65-32.000.
Rizio, Leo A. Lock hardware for outboard motor. 4,030,324, Cl. 70-232.000.
Robert Bosch G.m.b.H.: *See—*
Aldinger, Ulrich; and Kersten, Gunter, 4,030,405.
Bassler, Gerd; and Altpeter, Arno, 4,030,525.
Heiser, Joachim, 4,030,522.
Robert, Jacques: *See—*
Borel, Joseph; and Robert, Jacques, 4,031,529.
Robertson, Joseph D.; and Ward, Dean L. Drying system for particles. 4,030,205, Cl. 34-12.000.
Robillard, Edward George: *See—*
St. Andre, Arthur Francis; LeBlanc, Joseph David; and Robillard, Edward George, 4,031,446.
Robinson, Christopher Thomas. Vehicle jacks. 4,030,697, Cl. 254-8.00R.
Robinson, Elmer D.; and Struttmann, Hilarius S., to Borg-Warner Corporation. Bearing cartridge. 4,030,785, Cl. 308-187.000.
Robinson, Philip W. Furnace waste gas heat recovery device and method of using same. 4,030,877, Cl. 432-29.000.
Robinson, Ralph C.: *See—*
Freeman, John D.; Robinson, Ralph C.; and Swonger, Kenneth D., 4,031,363.
Robroy Industries: *See—*
Madej, Edward A., 4,030,866.
Roch, Jacques L., to Xynetics, Inc. Automatic cable forming system. 4,030,527, Cl. 140-92.100.
Rockwell International Corporation: *See—*
Archer, John L.; Tocci, Leonard R.; and Williams, Jeffrey L., 4,031,526.
Bake, Earl A.; and Schoeneweis, E. Frederick, 4,030,696.
Moll, Eberhard; and Walch, Leo M., Jr., 4,031,361.
Recker, Gary B., 4,031,386.
Rockwell, Thomas H. Percussion tool with noise reducing characteristics and method of making. 4,030,553, Cl. 173-1.000.
Rodenchuk, William Simon; and Eccles, Anthony Garth, to Alcan Research and Development Limited. Apparatus for continuous casting of metals. 4,030,536, Cl. 164-274.000.
Rodgers, Harris G., Sr.: *See—*
Phillips, Lawrence W.; and Rodgers, Harris G., Sr., 4,030,181.
Rodier, Rene Jean: *See—*
Droux, Jacques Pierre Leon; and Rodier, Rene Jean, 4,031,443.
Rodriguez, Jose E. Canopy release activating device for parachutes. 4,030,689, Cl. 244-151.00B.
Rogalski, Werner: *See—*
Gottschlich, Rudolf; Rogalski, Werner; Bergmann, Rolf; Steinigeweg, Rosmarie; and Wahlig, Helmut, 4,031,230.
Rogell, Paul S. Simulated gemstone. 4,030,317, Cl. 63-32.000.
Rogers, Jerry L.; and Cochran, Chudleigh B., to Brown Oil Tools, Inc. Swivel assembly. 4,030,546, Cl. 166-208.000.
Rogers, Paul. Efficiency and utilization of cooling towers. 4,031,173, Cl. 261-24.000.
Rogers, Philip John, to Pilkington P-E Limited. Infra-red lenses. 4,030,805, Cl. 350-2.000.
Rogers, Ronald D., to Alco Standard Corporation. Method and apparatus for circulating a heat treating gas. 4,030,712, Cl. 266-252.000.
Rohde, Wilhelm: *See—*
Wimber, Hans; Rohde, Wilhelm; and Reyhing, Jorg, 4,030,896.
Rohde, Wolfgang: *See—*
Beck, Kurt Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, 4,030,983.
Rohm and Haas Company: *See—*
deBenneville, Peter, 4,031,186.
Dupont, John A.; Kooch, Walter; and Scott, Joseph D., 4,031,055.
Johnson, Wayne O., 4,031,131.
Rohner, Michel Alexandre, to Singer Company, The. Multistage sorter having pushdown stacks with concurrent access to interstage buffer memories for arranging an input list into numerical order. 4,031,520, Cl. 364-200.000.
Roma, Carlo, to Belleli Industrie Meccaniche S.p.A. Tube nest for heat exchangers, and modular elements for said nest consisting of thermoplastic tubes, and process for manufacturing the modular elements and the tube nests. 4,030,540, Cl. 165-172.000.
Ron, Armando: *See—*
Aparicio, Luis; Gayo, Nenesio; M* ; Martin, Jose Luis; and Ron, Armando, 4,031,243.
Ronnquist, Hadar Yngve. Fecal matter collector. 4,030,500, Cl. 128-283.000.
Rooney, Clarence Stanley: *See—*
Williams, Haydn Windsor Richard; and Rooney, Clarence Stanley, 4,031,103.
Rosenberg, Jeffrey. Swimming pool surface cleaning device. 4,030,148, Cl. 4-172.000.
Rosenkranz, Hans Jurgen: *See—*
Stahlke, Kurt-Rainer; Krafft, Werner; Meyer, Rudolf; and Rosenkranz, Hans Jurgen, 4,030,926.
Ross, Alan Leslie: *See—*
Morse, Charles Richard; and Ross, Alan Leslie, 4,030,747.
Ross, Sigmund L., to Shuffman, Rose, Executrix. Apparatus for cryothermal fracturing of rock formations. 4,030,547, Cl. 166-212.000.
Roth, Ronald: *See—*
Linck, Donald W., II; and Kaprelian, George, 4,030,197.
Rothfuss, Robert G.; and Becht, Carl T., to Senco Products, Inc. Improved fastener applying device. 4,030,655, Cl. 227-130.000.
Rottloff, Gunther: *See—*
Sundermann, Rudolf; Rottloff, Gunther; and Grigat, Ernst, 4,031,067.
Rourke, Terence Arthur. Process for calcining limestone. 4,031,183, Cl. 423-175.000.
Roussel-UCLAF: *See—*
Chazan, Jean-Bernard; and Gasc, Jean-Claude, 4,031,210.
Routien, John B.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,031,206.
Rowan, Frank E., to Aluminum Plumbing Fixture Corporation. Combination plumbing fixture having single floor waste outlet. 4,030,145, Cl. 4-10.000.
Roy, Robert Gibson: *See—*
Woods, Gilbert Frederick; Logan, Robert Thomas; McGarry, George; and Roy, Robert Gibson, 4,031,075.
Rozenboom, Gustave; and Rickmann, Bernard C., to Square D Company. Bus bar and switchboard assemblage. 4,030,794, Cl. 339-22.00B.
Ruddick, Marie T.: *See—*
Ruddick, Roy M.; and Ruddick, Marie T., 4,030,449.
Ruddick, Roy M.; and Ruddick, Marie T. Pet litter deodorizing apparatus. 4,030,449, Cl. 119-1.000.
Rudiger, Gunther: *See—*
Nieschulz, Otto; Rudiger, Gunther; and Maass, Jurgen, 4,031,199.
Rudolph, Paul, to Metallgesellschaft Aktiengesellschaft. Process for treating raw gas produced by the pressure gasification of coal. 4,031,030, Cl. 252-373.000.
Rueda Segura, Eduardo, to Empresa De Representaciones Unidas, S.A. (Erusa). Electric radiant heater. 4,031,353, Cl. 219-345.000.
Rufer, Clemens: *See—*
Ahrens, Hanns; Biere, Helmut; Rufer, Clemens; Schmiechen, Ralph; Schroeder, Eberhard; Loge, Olaf; Losert, Wolfgang; and Schillinger, Ekkehard, 4,031,236.
Rumpf, Robert John: *See—*
Pilarski, Regis Victor; and Rumpf, Robert John, 4,031,344.
Runge, Hans-Jurgen, to Warner Lewis Jr. Industrie- Filter GmbH. Spring-loaded differential pressure gage. 4,030,368, Cl. 73-419.000.
Ruprecht, Hermann, to Maschinenfabrik Fahr Aktiengesellschaft. Rotary mower. 4,030,275, Cl. 56-192.000.
Rushmore, Dean Frederick: *See—*
Margolis, Geoffrey; Rushmore, Dean Frederick; and Liu, Richard Tien-Szu, 4,031,251.

Russell, Gary R.; Chen, Che Jen; and Harstad, Kenneth G., to United States of America, Ntional Aeronautics and Space Administration. Isotope separation using metallic vapor lasers. 4,031,389, Cl. 250-283.000.

Russell Harrington Cutlery, Inc.: *See*—
Umholtz, Franklyn G., 4,030,192.

Russell, John R., to E-Z Floss. Handle for disposable appliance. 4,030,199, Cl. 32-40.00R.

Rutschow, Joseph Fredrick; and Zucconi, Bruno, to Scala Radio Corporation; and Milliflect. Method of molding fiberglass reflecting antenna. 4,030,953, Cl. 156-79.000.

Rutter, Armin: *See*—
Jaskulke, Gerhard; Schwarz, Alois; and Rutter, Armin, 4,031,375.

Ryazanova, Rufina Mikhailovna: *See*—
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.

Rye, Grover W.: *See*—
Bhakuni, Roop S.; and Rye, Grover W., 4,031,288.

Rygalin, Viktor Georgievich: *See*—
Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich, 4,030,339.

Sabol, Albert R., to Standard Oil Company (Indiana). Phosphosulfurized hydrocarbon modified N-(hydroxy and alkyl-substituted benzyl) alkylene polyamine. 4,031,017, Cl. 252-46.700.

Saeki, Yukio: *See*—
Nakamura, Nobutaka; and Saeki, Yukio, 4,031,276.

Saiki, Noritsugu; Takeuchi, Yoshihiko; and Sakai, Hiroshi, to Teijin Limited. Process for preparing polyester clastomers. 4,031,165, Cl. 260-860.000.

Saiki, Yukimi; Ogino, Masanori; and Watanabe, Shutoku, to Hitachi, Ltd. Noise reducing circuit for video signals. 4,031,547, Cl. 358-167.000.

St. Andre, Arthur Francis; LeBlanc, Joseph David; and Robillard, Edward George, to Cincinnati Milacron-Heald Corporation. Machine tool. 4,031,446, Cl. 318-665.000.

Saint-Gobain Industries: *See*—
Pelzer, Rudolf; and Scholl, Heinz, 4,030,897.
Straeten, Franz-Josef; Pelzer, Rudolf; Feiten, Karl-Josef; and Stevens, Wilhelm-Josef, 4,030,961.

Saito, Takahiko: *See*—
Kimura, Hiroyuki; and Saito, Takahiko, 4,031,334.

Saka, Yoshimi, to Hitachi Metals, Ltd. Molding system. 4,030,535, Cl. 164-207.000.

Sakai, Hiroshi: *See*—
Saiki, Noritsugu; Takeuchi, Yoshihiko; and Sakai, Hiroshi, 4,031,165.

Sakai, Yoshio; and Kurosawa, Toshiaki, to Hitachi, Ltd. Over-speed preventing apparatus for DC motor. 4,031,439, Cl. 318-338.000.

Sakamoto, Yoichi, to Matsushita Electric Industrial Co., Ltd. Tuning apparatus using a voltage-dependent reactance element. 4,031,491, Cl. 334-15.000.

Sakanaka, Yasuhiro: *See*—
Shimizu, Akihiko; and Sakanaka, Yasuhiro, 4,031,302.

Sakurai, Yoshihisa: *See*—
Kojima, Kojiro; Sakurai, Yoshihisa; Sugai, Tetuya; and Motegi, Masayoshi, 4,030,837.

Sale, Morris D. Bird trap. 4,030,229, Cl. 43-69.000.

Saleck, Wilhelm: *See*—
Idel, Karsten-Josef; Saleck, Wilhelm; Wolff, Erich; and Freitag, Dieter, 4,030,929.

Sanders, James Milton; Taylor, William I.; Hill, Ira D.; and Kryschuk, John J., to International Flavors & Fragrances Inc. Process for producing mixture containing 4-(4'-methyl-4'-hydroxyamyl)-Δ^3-cyclohexene carboxaldehyde. 4,031,161, Cl. 260-598.000.

Sandoval, Dante J. Thermal motor. 4,030,298, Cl. 60-527.000.

Sandoz, Inc.: *See*—
Jackson, Thomas E., 4,031,227.
Kathawala, Faizulla G., 4,031,233.

Sandoz Ltd.: *See*—
Bastian, Jean-Michel; and Berthold, Richard, 4,031,225.

Sands, Asa D. Ball-type safety valve. 4,030,520, Cl. 137-513.500.

Sandstrom, Unto: *See*—
Colding, Bertil; Novak, Arne; Sandstrom, Unto; and Jakobsson, Goran, 4,031,368.

Sangster, Arlon G. Exposure station for a contact printing device. 4,030,826, Cl. 355-104.000.

Sankyo Electric Company, Limited: *See*—
Harashima, Ikuo, 4,030,632.

Sano, Akira: *See*—
Murai, Hiromu; Kitaguchi, Koji; Suminokura, Tatsuo; Sano, Akira; Kise, Masahiro; Kitano, Masahiko; and Tomita, Toshio, 4,031,303.

Sano, Ichiro, to Furukawa Battery Co., Ltd., The. Splash-proof device for use in a storage battery. 4,031,294, Cl. 429-82.000.

Sansburry, James D.: *See*—
Luce, Robert L.; Perry, Joseph P.; and Sansburry, James D., 4,030,952.

Sant'Andrea Novara Officine Meccaniche e Fonderie S.p.A.: *See*—
Vedani, Augusto, 4,030,674.

Santer, James O.: *See*—
Hahn, Frank J.; and Santer, James O., 4,031,057.

Sanyo Chemical Industries, Ltd.: *See*—
Tominaga, Yoichi; and Shibahara, Yasuo, 4,030,970.

Sanyo Electric Co., Ltd.: *See*—
Arai, Takeshi, 4,031,475.

Sarancha, Vladimir Nikolaevich: *See*—
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Sarbacher, Robert I.; and Bogue, John C., to Bogue, John C. Electrochemical energy cell. 4,031,296, Cl. 429-116.000.

Sargisson, Donald Farley, to General Electric Company. Thrust reverser for a gas turbofan engine. 4,030,291, Cl. 60-226.00A.

Sasaki, Kazuya; Naito, Takanobu; Momoki, Yoshio; Sega, Toshio; and Satomi, Toshiyuki, to Kaken Chemical Co., Ltd. Streptovaricinone C derivatives as antibiotics. 4,031,215, Cl. 424-244.000.

Sasayama, Takao; and Nishimiya, Torazo, to Hitachi, Ltd. Air-fuel ratio controller for internal-combustion engine. 4,030,462, Cl. 123-119.0EC.

Sasebo Jukogyo Kabushiki Kaisha: *See*—
Nagata, Toshio; Kawasaki, Kunijiro; Takahama, Ryuichiro; Miyatani, Yoshifusa; and Funakoshi, Sozo, 4,030,441.

Sashihara, Kenji; Masuda, Takao; Noguchi, Yasuhiro; Sekikawa, Nobuyoshi; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Heat-developable light-sensitive material. 4,030,930, Cl. 96-114.100.

Sashihara, Kenji: *See*—
Noguchi, Yasuhiro; Ukai, Toshinao; Sashihara, Kenji; and Masuda, Takao, 4,030,931.

Sato, Michito: *See*—
Mandai, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; and Sato, Michito, 4,031,159.

Sato, Tomoyoshi: *See*—
Sonobe, Shigeru; Watanabe, Makoto; Kato, Iwao; and Sato, Tomoyoshi, 4,030,828.

Satomi, Toshiyuki: *See*—
Sasaki, Kazuya; Naito, Takanobu; Momoki, Yoshio; Sega, Toshio; and Satomi, Toshiyuki, 4,031,215.

Satterwhite, Charles R., to Unit Rig & Equipment Co. Two wheel excavating and loading system. 4,030,217, Cl. 37-190.000.

Sauthier, Pierre A.; and Vuilleumier, Cyril, to Societe Suisse Pour l'Industrie Horlogere Management Services S.A. Electrically driven time piece with means for effecting a precise setting of time. 4,030,283, Cl. 58-23.00R.

Saxon, B. Ronald, to International Telephone and Telegraph Corporation. Time limited telephone paging employs a relay switch actuated by dual frequency tone. 4,031,329, Cl. 179-18.0BF.

Scala Radio Corporation: *See*—
Rutschow, Joseph Fredrick; and Zucconi, Bruno, 4,030,953.

Scans Associates, Inc.: *See*—
Smith, Richard L.; and Mosher, Peter J., 4,030,352.
Smith, Richard Lawrence, 4,030,351.

Schaefer, William H.; and Bender, Richard E., to General Dynamics Corporation. Method for molding high strength facing. 4,031,181, Cl. 264-135.000.

Schaefers, Elvin J. Cartridge for fishing flies and leaders. 4,030,228, Cl. 43-57.50R.

Schafer, Dietmar: *See*—
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,207.
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Karl Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,208.

Schaffer, Claus: *See*—
Spiesberger, August; and Schaffer, Claus, 4,031,419.

Schampers, Paulus Philippus Maria; and De Rijke, Pieter Adrianus, to U.S. Philips Corporation. Method of manufacturing an electric discharge tube. 4,030,789, Cl. 316-19.000.

Schank, Richard L., to Xerox Corporation. Waterless printing masters. 4,030,416, Cl. 101-450.000.

Scharpenberg, Hans-Georg: *See*—
Oppenlaender, Knut; Uhl, Guenter; Helfert, Herbert; Scharpenberg, Hans-Georg; and Stork, Karl, 4,031,112.

Schat, Hermannus; and Freyberger, Laurin Clemens, to ITT Industries, Inc. Monolithic integrated circuit for the distortion of a saw-tooth signal. 4,031,411, Cl. 307-228.000.

Scheben, Quirin: *See*—
Renner, Gunter; Boie, Immo; and Scheben, Quirin, 4,031,130.

Scheer, Martin: *See*—
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,207.
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Karl Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,208.

Scheffer, Harvey Dow Gibson, to RCA Corporation. Wire lead bonding tool. 4,030,657, Cl. 228-1.00R.

Scheithauer, Steffen: *See—*
Gahler, Siegfried; Junge, Karl-Wilhelm; Fischer, Gunther; Scheithauer, Steffen; and Viola, Horst, 4,030,928.

Schellenbaum, Max; Duennenberger, Max; and Casagrande, Fulvio, to Ciba-Geigy AG. Microbicidal agents containing as active ingredient monohydroxyphenyl carbinols. 4,031,248, Cl. 424-347.000.

Scherbel, Gordon H.: *See—*
Shepard, E. Dwayne; and Scherbel, Gordon H., 4,030,709.

Schering Aktiengesellschaft: *See—*
Ahrens, Hanns; Biere, Helmut; Rufer, Clemens; Schmiechen, Ralph; Schroeder, Eberhard; Loge, Olaf; Losert, Wolfgang; and Schillinger, Ekkehard, 4,031,236.

Scheuerman, Ronald F.: *See—*
Richardson, Edwin A.; and Scheuerman, Ronald F., 4,030,548.

Schieber, Michael M.; Beinglass, Israel; and Dishon, Giora, to United States of America, Energy Research and Development Administration. Temperature cycling vapor deposition HgI_2 crystal growth. 4,030,964, Cl. 156-610.000.

Schild, Ekkehard, to Bayerische Motoren Werke Aktiengesellschaft. Centrifugal adjusting mechanism for ignition interrupters of internal combustion engines. 4,030,467, Cl. 123-146.50A.

Schillinger, Ekkehard: *See—*
Ahrens, Hanns; Biere, Helmut; Rufer, Clemens; Schmiechen, Ralph; Schroeder, Eberhard; Loge, Olaf; Losert, Wolfgang; and Schillinger, Ekkehard, 4,031,236.

Schimmel, Vernon R., to Symons Corporation. Composite concrete wall form unit with a special transition bolt. 4,030,694, Cl. 249-196.000.

Schirtzinger, Joseph F., to Sea-Log Corporation. Monopod drilling platform with directional drilling. 4,030,310, Cl. 61-86.000.

Schlumberger Technology Corporation: *See—*
Murphy, Richard D., 4,031,367.

Schluter, Wilhelm; and Pohler, Heinz, to Hoesch Werke Aktiengesellschaft. Multi-row anti-friction bearing. 4,030,786, Cl. 308-227.000.

Schmermund, Alfred. Control arrangement for a cam production machine. 4,031,445, Cl. 318-568.000.

Schmidt, Delf: *See—*
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,207.
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Karl Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,208.

Schmidt, Jurgen: *See—*
Grund, Peter; Schmidt, Jurgen; and Hesse, Jurgen, 4,030,247.

Schmidt, Siegbert: *See—*
Piret, Norbert L.; Rabben, Hans Joachim; Kudelka, Herbert; and Schmidt, Siegbert, 4,030,990.

Schmiechen, Ralph: *See—*
Ahrens, Hanns; Biere, Helmut; Rufer, Clemens; Schmiechen, Ralph; Schroeder, Eberhard; Loge, Olaf; Losert, Wolfgang; and Schillinger, Ekkehard, 4,031,236.

Schmitt, Joseph Lawrence, Jr.; Walker, Philip Leroy, Jr.; and Castellion, George Augustus, to American Cyanamid Company. Catalysts based on carbon supports and use in catalytic deoxidation process. 4,031,137, Cl. 260-559.0AT.

Schmitt, Ludwig; and Kipping, Joachim, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Device for drafting long staple fibre sliver. 4,030,165, Cl. 19-.200.

Schmitter, Andre; and Seiz, Wolfgang, to Ciba-Geigy Corporation. Process for the manufacture of foams from epoxide resins. 4,031,043, Cl. 260-2.5EP.

Schnabel, Walter. Toy building blocks. 4,030,236, Cl. 46-25.000.

Schnee, Karl; Tichy, Dieter; and Piesch, Steffen, to Cassella Farbwerke Mainkur Aktiengesellschaft. Aminoplast curing agents. 4,031,064, Cl. 260-67.60R.

Schneider, Abraham: *See—*
Suld, George; Schneider, Abraham; and Myers, Harry K., Jr., 4,031,150.

Schoeffler, Romona B.: *See—*
Schoeffler, William N.; and Schoeffler, Romona B., 4,030,745.

Schoeffler, William N.; and Schoeffler, Romona B. Tool retriever for wells. 4,030,745, Cl. 294-86.140.

Schoeneweis, E. Frederick: *See—*
Bake, Earl A.; and Schoeneweis, E. Frederick, 4,030,696.

Schoenfield, Palmer J.: *See—*
Allen, Robert K.; Schoenfield, Palmer J.; and Morrison, Howard J., 4,030,234.
Terzian, Rouben T.; Schoenfield, Palmer J.; Dunn, Kathy A.; and Kuna, Wayne A., 4,030,235.

Schoeps, Jochen: *See—*
Dhein, Rolf; Schoeps, Jochen; and Kuchenmeister, Rolf, 4,031,052.

Scholin, Harold W.; and Lisiecke, Hieronim L., to Scholin Industries, Inc. Washer cutting machine. 4,030,385, Cl. 82-48.000.

Scholin Industries, Inc.: *See—*
Scholin, Harold W.; and Lisiecke, Hieronim L., 4,030,385.

Scholl, Heinz: *See—*
Pelzer, Rudolf; and Scholl, Heinz, 4,030,897.

Schollhorn, Fritz: *See—*
Reber, Erwin; and Schollhorn, Fritz, 4,030,274.

Schopper, Alf; and Linder, Jean, to Heberlein Hispano S.A. Surveying device. 4,030,281, Cl. 57-87.000.

Schott, Charles M., Jr., to Gloucester Engineering Co. Inc. Roll winder. 4,030,681, Cl. 242-81.000.

Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, to International Flavors & Fragrances Inc. 4- and 5-Phenyl pentenal acetals. 4,031,140, Cl. 260-611.00A.

Schrider, Michael Stanley, to American Cyanamid Company. Cyclopropanecarboxylates for systemic control of ectoparasites. 4,031,239, Cl. 424-304.000.

Schrock, Wilfried: *See—*
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,031,229.

Schroder, Theo: *See—*
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,207.
Bauer, Klaus; Frommer, Werner; Kaufmann, Wilfried; Metzger, Karl Georg; Scheer, Martin; Schmidt, Delf; Schroder, Theo; and Schafer, Dietmar, 4,031,208.

Schroeder, Eberhard: *See—*
Ahrens, Hanns; Biere, Helmut; Rufer, Clemens; Schmiechen, Ralph; Schroeder, Eberhard; Loge, Olaf; Losert, Wolfgang; and Schillinger, Ekkehard, 4,031,236.

Schroeder, George F.: *See—*
Groudan, Alan I.; Schroeder, George F.; and Treffinger, H. Lee, 4,031,374.

Schubert, Gunter: *See—*
Enneking, Heinrich; Schubert, Gunter; and Baumann, Karl-Heinz, 4,030,169.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Schmitt, Ludwig; and Kipping, Joachim, 4,030,165.

Schulte, Hubert: *See—*
Moeller, Jurgen; Mitrach, Werner; Krauss, Helmut; and Schulte, Hubert, 4,031,459.

Schultes, Tilmann, to Kortenbach & Rauh Kommanditgesellschaft. Shortenable umbrella. 4,030,514, Cl. 135-25.00R.

Schultz, Thomas W.: *See—*
Williams, G. Norman; and Schultz, Thomas W., 4,030,790.

Schulze, Ehrhart, to Felix Stiegler Maschinenfabrik. Equalizing device for movements in packing machines, especially machines for making bags and the like. 4,030,652, Cl. 226-114.000.

Schuster, Hans Gunther: *See—*
Poetzsch, Rolf; and Schuster, Hans Gunther, 4,030,386.

Schwartz, Samuel, to Intel Corporation. Propagation line adder and method for binary addition. 4,031,379, Cl. 235-175.000.

Schwarz, Alois: *See—*
Jaskulke, Gerhard; Schwarz, Alois; and Rutter, Armin, 4,031,375.

Schwarz, Leonard H., to Dunham-Bush, Inc. Method of manufacturing low cost non-porous metal connecting rods. 4,030,179, Cl. 29-156.50A.

Schweder, Frederic James: *See—*
Sung, Pei; and Schweder, Frederic James, 4,030,918.

Schwuchow, Norbert; and Hutai, Hubert, to Daimler-Benz Aktiengesellschaft. Motor vehicle bumper. 4,030,744, Cl. 293-71.00R.

Scott, Joseph D.: *See—*
Dupont, John A.; Kooch, Walter; and Scott, Joseph D., 4,031,055.

Scott, Kenneth F. Testing of ram and annular blowout preventers. 4,030,354, Cl. 73-151.000.

Sea-Log Corporation: *See—*
Schirtzinger, Joseph F., 4,030,310.

Sea Solar Power, Inc.: *See—*
Anderson, James H., 4,030,301.

Seaman, Wesley Arthur: *See—*
Krause, Ernest Harry; Seaman, Wesley Arthur; and Angelopoulos, Peter Gregory, 4,031,466.

Sebag, Henri: *See—*
Vanlerberghe, Guy; and Sebag, Henri, 4,031,025.

Sega, Kenji: *See—*
Suzuki, Osamu; Akashi, Goro; Kasuga, Akira; and Sega, Kenji, 4,030,685.

Sega, Toshio: *See—*
Sasaki, Kazuya; Naito, Takanobu; Momoki, Yoshio; Sega, Toshio; and Satomi, Toshiyuki, 4,031,215.

Seidel, William C.: *See—*
Mitchell, William A.; and Seidel, William C., 4,031,266.

Seifert, Horst: *See—*
Ziegler, Reinhard; and Seifert, Horst, 4,031,425.

Seiz, Wolfgang: *See—*
Schmitter, Andre; and Seiz, Wolfgang, 4,031,043.

Seki, Mitsuaki: *See—*
Hanagata, Takayoshi; Gushima, Hideki; and Seki, Mitsuaki, 4,030,588.

Sekikawa, Nobuyoshi: *See—*
Sashihara, Kenji; Masuda, Takao; Noguchi, Yasuhiro; Sekikawa, Nobuyoshi; and Shishido, Tadao, 4,030,930.

Sell, Leslie James, to Picker X-Ray Mfg. Limited. Lineal lock for X-ray apparatus. 4,030,579, Cl. 188-171.000.

Semperit Aktiengesellschaft: *See—*
Steiner, Anton, 4,030,393.

Sencer, Mevhibe Gulay, to Northern Electric Company Limited. Telephone speech network. 4,031,331, Cl. 179-81.00A.

Senco Products, Inc.: *See—*
Rothfuss, Robert G.; and Becht, Carl T., 4,030,655.

Sensibar, Ezra, to Construction Aggregates Corporation. Hopper valve module for hopper dredge. 4,030,435, Cl. 114-36.000.

Sergovic, John A., to Burns & Russell Company of Baltimore City, The. Stain resistant polyester-coated block. 4,031,289, Cl. 428-451.000.

Serlovsky, Frank V., to D.N.S. Precision Machining. Adjustable printed circuit board pallet. 4,030,717, Cl. 269-118.000.

Sesselmann, Hans Dieter: *See—*
Pickert, Hansjurgen; Sesselmann, Hans Dieter; and Timmers, Leonardes August, 4,030,430.

Seymour, Claude W. Rake device. 4,030,157, Cl. 15-142.000.

Seymus, Herman Ernest, to Du Pont de Nemours, E. I., and Company. Fluorocarbon polymer coating compositions containing mica particles. 4,031,286, Cl. 428-324.000.

Shaare Zedek Hospital: *See—*
Zioni, Dov; and Halperin, Levi Y., 4,031,435.

Shaduya, Vladimir Leontievich: *See—*
Chachin, Viktor Nikolaevich; Zhuravsky, Alexandr Julyanovich; Zdor, Gennady Nikolaevich; Shaduya, Vladimir Leontievich; and Golovkina, Elena Yakovlevna, 4,030,329.

Shako, Hisahumi: *See—*
Hashimoto, Michiyoshi; and Shako, Hisahumi, 4,030,561.

Shantzer, Aaron, deceased: *See—*
Wallin, Mark; and Shantzer, Aaron, deceased, 4,030,312.

Shantzer, Helen, executrix: *See—*
Wallin, Mark; and Shantzer, Aaron, deceased, 4,030,312.

Shantzer-Wallin Corporation: *See—*
Wallin, Mark; and Shantzer, Aaron, deceased, 4,030,312.

Shaposhnikov, Jury Davydovich: *See—*
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.

Sharkey, William Henry; and Harris, John Ferguson, Jr., to Du Pont de Nemours, E. I., and Company. Copolymers of isobutylene and a vinylbenzene and graft polymers thereof with pivalolactone. 4,031,168, Cl. 260-896.000.

Shatalova, Alla Nikolaevna: *See—*
Khcheyan, Khachik Egorovich; Revenko, Olga Mikhailovna; Shatalova, Alla Nikolaevna; Gelperina, Eleonora Grigorievna; Agrinskaya, Lidia Ivanovna; and Muradian, Georgy Avanesovich, 4,031,128.

Shaw, Mark Layne, to Motorola, Inc. System for transferring four commands over a single conductor utilizing dual threshold logic gates. 4,031,477, Cl. 328-70.000.

Sheesley, Wilmer Lee, to AMP Incorporated. Electrical contact system. 4,030,791, Cl. 339-5.00M.

Shell Oil Company: *See—*
Berger, Hans; De Lind Van Wijngaarden, Gerhard; and Breuker, Jacobus H., 4,031,016.
Lukas, Joachim H.; Baardman, Frank; and Kouwenhoven, Adriaan P., 4,031,152.
Murphy, Zatis L., 4,031,018.
Powell, James E., 4,031,087.
Richardson, Edwin A.; and Scheuerman, Ronald F., 4,030,548.

Shelton, Jack P., Sr.; and Adam, John M. Insect carrier and dispenser apparatus. 4,030,226, Cl. 43-55.000.

Shemtov, Sami, to I-T-E Imperial Corporation EFCOR Division. Attachment for thread cutting apparatus. 4,030,153, Cl. 10-89.0WH.

Shepard, E. Dwayne; and Scherbel, Gordon H., to FMC Corporation. Method of plugging tapholes in phosphorus furnaces. 4,030,709, Cl. 266-45.000.

Sherman, Benjamin F., Jr. Catoptric system for simultaneous concentration of light, laser, and other type paraxial rays into beams. 4,031,384, Cl. 250-203.00R.

Sheth, Harshadrai D. Electronic hour glass clock. 4,030,285, Cl. 58-50.00R.

Shibahara, Yasuo: *See—*
Tominaga, Yoichi; and Shibahara, Yasuo, 4,030,970.

Shibakawa, Riichiro: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,031,206.

Shibutami, Hirohiko: *See—*
Itoh, Yasuo; Suzuki, Yoshitake; Shibutami, Hirohiko; Hirano, Koichi; and Tagami, Muneo, 4,030,533.

Shilling, Jack W.; Datta, Amitava; and Malagari, Frank A., Jr., to Allegheny Ludlum Industries, Inc. Process for cube-on-edge oriented boron-bearing silicon steel including normalizing. 4,030,950, Cl. 148-112.000.

Shima, Masao: *See—*
Togo, Masaaki; Shima, Masao; and Mochizuki, Kiyoshi, 4,031,447.

Shimada, Shunji; and Wakimoto, Harumi, to Hitachi, Ltd. Signal converter circuit. 4,031,409, Cl. 307-208.000.

Shimada, Shunji; Hatsukano, Yoshikazu; and Yamashiro, Osamu, to Hitachi, Ltd. Constant-current circuit. 4,031,456, Cl. 323-4.000.

Shimano Industrial Company, Limited: *See—*
Isobe, Mitsuhide, 4,030,374.
Nagano, Masashi, 4,030,375.

Shimizu, Akihiko; and Sakanaka, Yasuhiro, to Toyo Soda Manufacturing Co., Ltd. Process for preparing granular rubber. 4,031,302, Cl. 528-486.000.

Shinkawa, Keiro; Sodeyama, Chiuichi; Kaneko, Yoichi; and Kimura, Katsuhiro, to Hitachi, Ltd. Mixer circuit. 4,031,472, Cl. 325-446.000.

Shinskey, Francis G., to Foxboro Company, The. Control for maximizing capacity and optimizing product cost of distillation column. 4,030,986, Cl. 203-2.000.

Shionogi & Co., Ltd.: *See—*
Sugasawa, Tsutomu, 4,031,098.

Shirayama, Kenzo; Kita, Shinichiro; and Fujimoto, Masanori, to Sumitomo Chemical Company, Limited. Polyolefin composition and process for preparing the same. 4,031,062, Cl. 260-42.450.

Shishido, Tadao: *See—*
Sashihara, Kenji; Masuda, Takao; Noguchi, Yasuhiro; Sekikawa, Nobuyoshi; and Shishido, Tadao, 4,030,930.

Shnypikov, Alexandr Dmitrievich: *See—*
Shults, Mikhail Mikhailovich; Parfenov, Anatoly Ivanovich; Shnypikov, Alexandr Dmitrievich; Krunchak, Vladimir Georgievich; Evnina, Sarra Borisovna; Dolidze, Vladimir Alexandrovich; and Tarasova, Valentina Mikhailovna, 4,030,935.

Shuffman, Rose, Executrix: *See—*
Ross, Sigmund L., 4,030,547.

Shults, Mikhail Mikhailovich; Parfenov, Anatoly Ivanovich; Shnypikov, Alexandr Dmitrievich; Krunchak, Vladimir Georgievich; Evnina, Sarra Borisovna; Dolidze, Vladimir Alexandrovich; and Tarasova, Valentina Mikhailovna. Glass. 4,030,935, Cl. 106-52.000.

Shuster, Edward J.: *See—*
Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., 4,031,034.

Shuster, Edward Joseph: *See—*
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,031,140.

Shutt, Donald P., to Western Gear Corporation. Effort limiting and interrupting actuator. 4,030,353, Cl. 73-139.000.

Shylo, Paul, to Cook Electric Company. Telephone ringer insolator. 4,031,332, Cl. 179-84.00R.

Siby, Sture: *See—*
Dahle, Orvar; von Knorring, Folke; and Siby, Sture, 4,030,346.

Siciliano, Anthony J.: *See—*
Keen, Everett M.; and Siciliano, Anthony J., 4,030,452.

Siebert, Werner: *See—*
Beck, Kurt Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, 4,030,983.

Siegel, Walter P.: *See—*
Boser, Ronald J.; and Siegel, Walter P., 4,030,429.

Siegmund, Walter P., to American Optical Corporation. Channel structure for multi-channel electron multipliers and method of making same. 4,031,423, Cl. 313-105.0CM.

Siemens Aktiengesellschaft: *See—*
Bittermann, Hans, 4,031,314.
Brueckner, Wolfgang, 4,031,499.
Jaskulke, Gerhard; Schwarz, Alois; and Rutter, Armin, 4,031,375.
Muller, Karl-Heinz; Rindfleisch, Volker; Rauch, Moriz V.; and Willasch, Dieter, 4,031,390.
Pfleiderer, Hans-Joerg, 4,031,315.
Reisinger, Konrad; and Holzl, Ludwig, 4,031,316.

Siems, Lee E., to Western Geophysical Company of America. Multiplexer commutated high pass filter. 4,031,506, Cl. 340-15.5GC.

Sierra, Austin V., Jr., to Cities Service Company. Slop oil treating system. 4,031,007, Cl. 210-59.000.

Sigma Chemical Company: *See—*
Das, Manik L., 4,030,885.
Starkweather, William H., 4,030,995.

Sih, Charles J., to Wisconsin Alumni Research Foundation. 15-Deoxy-PGE_1 and method for preparing same. 4,031,129, Cl. 260-468.00D.

Siller, Vinzenz, to Esser-Werke GmbH vorm. Westmontan-Werke. Method and apparatus for the surface hardening of the inner surface of tube bends. 4,030,711, Cl. 266-123.000.

Simbruner, Georg, to Dragerwerk Aktiengesellschaft. Device for supporting human breathing and artificial respiration. 4,030,492, Cl. 128-145.800.

Simciak, Walter, to Northern Illinois Gas Company. RF data exchange system. 4,031,513, Cl. 340-152.00T.

Simpson, Earle E.: *See—*
Hornig, Carl F.; Kroupa, Kenneth M.; and Simpson, Earle E., 4,030,966.

Simpson, Ralph E. Tape winding device. 4,030,678, Cl. 242-67.200.

Simpson, Terry Lee, to Atlantic Richfield Company. Longwall mining of thick underground mineral seams. 4,030,752, Cl. 299-11.000.

Singer Company, The: *See—*
Carver, Fred F.; and Hoyt, Carl E., 4,030,208.
Groudan, Alan I.; Schroeder, George F.; and Treffinger, H. Lee, 4,031,374.
Johnson, Edgar A., 4,031,469.
Johnson, Ronald P.; and Bell, Reynold W., 4,031,507.
Kron, Gerald J., 4,030,207.
Martin, Adolph; and Edwards, William Joseph, 4,030,431.
Rohner, Michel Alexandre, 4,031,520.

Singleton, Lewis, Jr.; and Whitney, James M. Alerting process and system of apparatus therefor. 4,031,467, Cl. 325-54.000.

Sintron, Cruz. Hoop and propelled means. 4,030,242, Cl. 46-220.000.

Sirius Corporation: *See—*
Fairbairn, Thomas E., 4,031,268.

Skagerlund, Lars-Erik, to AB Bofors. Device for ground-controlled activation of proximity fuzes. 4,030,420, Cl. 102-70.20P.

Skarek, Jiri: *See—*
Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, 4,030,944.

SKF Industrial Trading and Development Company, B.V.: *See—*
Ernst, Horst M.; Olschewski, Armin; and Brandenstein, Manfred, 4,030,191.

Skretting, Arne, to Kamyr Aktiebolag. Method and apparatus for fiber suspension dewatering. 4,031,013, Cl. 210-326.000.

Smit, Elzo, to U.S. Philips Corporation. Stereo pick-up with casing serving as common pole piece. 4,031,335, Cl. 179-100.41K.

Smith, Edwin Studley, to Goodyear Tire & Rubber Company, The. Polymerization of monomers. 4,031,297, Cl. 526-87.000.

Smith, Gary C., Jr., to Champion Spark Plug Company. Paint pump for airless spray guns. 4,030,857, Cl. 417-46.000.

Smith, Harry: *See—*
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 4,031,099.

Smith, Leward N.; and Morey, Larry L., to Morbark Industries, Inc. Vibrating tubular screen. 4,030,606, Cl. 209-287.000.

Smith, Marvin L.: *See—*
Berry, Martin F.; Reesman, Stanley H.; Smith, Marvin L.; and Middlesworth, Peter Van, 4,031,267.

Smith, Philip D. Solar collector with conical elements. 4,030,477, Cl. 126-270.000.

Smith, Richard L.; and Mosher, Peter J., to Scans Associates, Inc. Apparatus for reproducing operating conditions in induced flow devices. 4,030,352, Cl. 73-118.000.

Smith, Richard Lawrence, to Scans Associates, Inc. Method and apparatus for laboratory testing of carburetors. 4,030,351, Cl. 73-118.000.

Smith, Richard S., to Xerox Corporation. Reproducing apparatus having an improved imaging surface cleaning system. 4,030,824, Cl. 355-15.000.

Smith, Tennyson, to United States of America, Air Force. Method for mapping surfaces with respect to ellipsometric parameters. 4,030,836, Cl. 356-118.000.

Smith & Wesson Chemical Company, Inc.: *See—*
Litman, Alan, 4,030,421.

Smola, Raymond L., to Morgan Construction Company. Tool assembly for mounting and removing overhung rolls. 4,030,183, Cl. 29-252.000.

Snam Progetti S.p.A.: *See—*
Lostia, Onofrio; and Bartoli, Francesco, 4,031,201.
Rescalli, Carlo; and Pacifico, Antonio, 4,031,157.

Snyder, Robert O.; and Klink, Otto W. Cartons. 4,030,596, Cl. 206-45.260.

Sobel, Arthur: *See—*
Rando, Joseph F.; Sobel, Arthur; and Davidson, Richard W., 4,030,832.

Sobolev, Vilyam Alexandrovich: *See—*
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.

Societa' Farmaceutici Italia S.p.A.: *See—*
Patelli, Bianca; Bernardi, Luigi; Arcamone, Federico; and di Marco, Aurelio, 4,031,211.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Barba, Diego; Germana, Antonino; Liuzzo, Giuseppe; and Tagliaferri, Giovanni, 4,030,985.
Barba, Diego; Battistoni, Fabrizio; D'Agostini, Candido; and Macchi, Giorgio, 4,031,187.

Societe Anonyme dite: L'Oreal: *See—*
Kalopissis, Gregoire; and Bugaut, Andree, 4,031,160.
Kalopissis, Gregoire; and Vanlerberghe, Guy, 4,031,263.
Papantoniou, Christos; and Gaetani, Quintino, 4,030,512.
Vanlerberghe, Guy; and Sebag, Henri, 4,031,025.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Margolis, Geoffrey; Rushmore, Dean Frederick; and Liu, Richard Tien-Szu, 4,031,251.

Societe Francaise des Silicates Speciaux "Sifrance": *See—*
Vrisakis, Georges, 4,031,024.

Societe Lignes Telegraphiques et Telephoniques: *See—*
Bernard, Nicolle; and Forterre, Gerard, 4,031,489.

Societe Metallurgique de Revigny: *See—*
Mandras, Christian Maurice; and Stanik, Carol, 4,030,680.

Societe Presstub: *See—*
Drancourt, Claude, 4,030,636.

Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Bichsel, Daniel, 4,030,337.
Sauthier, Pierre A.; and Vuilleumier, Cyril, 4,030,283.

Sodeyama, Chiuichi: *See—*
Shinkawa, Keiro; Sodeyama, Chiuichi; Kaneko, Yoichi; and Kimura, Katsuhiro, 4,031,472.

Sokolov, Sergei Vasilievich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.

Solfjeld, Poul: *See—*
Lund, Svend Aage; Northeved, Allan; Solfjeld, Poul; and Fabrin, Knud Christian Claus, 4,030,343.
Northeved, Allan; Fabrin, Knud Christian Claus; and Solfjeld, Poul, 4,030,344.

Sommer, Carl G. Cartridge loading device for revolvers. 4,030,222, Cl. 42-89.000.

Sommer, Edward J., Jr.; Kenny, Garry R.; Knoll, Frank S.; and Mitchell, David W. Feed system for an electromagnetic eddy current materials separator. 4,031,004, Cl. 209-212.000.

Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, to Ceskoslovenska akademie ved. Production of annular products from centrifugally cast steel structures. 4,030,944, Cl. 148-2.000.

Sonntag, Marvin A. Protective apron and method of fabrication. 4,030,139, Cl. 2-51.000.

Sonobe, Shigeru; Watanabe, Makoto; Kato, Iwao; and Sato, Tomoyoshi, to Hitachi, Ltd. Spectrophotometer. 4,030,828, Cl. 356-96.000.

Sony Corporation: *See—*
Arisawa, Kuniyoshi; and Amano, Yoshifumi, 4,031,541.
Kato, Yoshiro; and Fujita, Choichi, 4,031,548.
Kimura, Hiroyuki; and Saito, Takahiko, 4,031,334.
Kusaka, Satoru, 4,031,558.
Sumiyoshi, Hiroji; and Chiba, Tomosuke, 4,031,553.
Suzuki, Tadao; Yoshida, Tadao; and Wachi, Shigeaki, 4,031,454.
Tsurushima, Katsuaki, 4,031,482.
Yoshida, Tadao, 4,031,481.

Sopko, Roy. Bicycle brake light switch and stop light system being activated by hand brake lever and cable. 4,031,343, Cl. 200-61.120.

Soudijn, Willem; van Wijngaarden, Ineke; and Janssen, Paul Adriaan Jan, to Janssen Pharmaceutica N.V. N-[(1-piperidinyl)alkyl]arylcarboxamide derivatives. 4,031,226, Cl. 424-267.000.

Soule, Gustave H., Jr., to Raymond Lee Organization, Inc., The, a part interest. Electronic read out tape measure. 4,031,360, Cl. 235-92.0DN.

Southwest Research Institute: *See—*
Mallow, William A., 4,030,939.

Southwire Company: *See—*
Loest, Kent W., 4,031,182.
Ward, George C., 4,030,537.

Souza, Anthony J., to Woodstream Corporation. Automatically adjusting boat seat. 4,030,152, Cl. 9-7.000.

Souza, Anthony J., to Woodstream Corporation. Animal trap and package therefor. 4,030,230, Cl. 43-81.000.

Special Sewing Systems, Inc.: *See—*
Boser, Ronald J.; and Siegel, Walter P., 4,030,429.

Spectra-Physics, Inc.: *See—*
Rando, Joseph F.; Sobel, Arthur; and Davidson, Richard W., 4,030,832.

Speedrack Inc.: *See—*
Konstant, Anthony N., 4,030,611.

Spencer, Alan Roderick: *See—*
Pedlar, Roy; Spencer, Alan Roderick; and Edwards, Colin, 4,030,434.

Sperry Rand Corporation: *See—*
Formeister, Richard B., 4,031,483.
Isbister, Eric J., 4,031,535.
Rice, Jeffrey C.; and Tucker, Terry A., 4,031,531.
Wesner, Charles R., 4,031,417.

Spies, Alfons, to Dr. Johannes Heidenhain GmbH. Resilient support for spinning-ring or twisting-ring bearing. 4,030,282, Cl. 57-124.000.

Spiesberger, August; and Schaffer, Claus, to Gerhard Berger, Fabrik Elektrischer Messgerate. Self-starting synchronous and stepping motor having a permanent magnet rotor. 4,031,419, Cl. 310-49.00R.

Spiridonov, Eduard Georgievich: *See—*
Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tatarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,030,891.

Springer, Edward M., to Heyer Inc. Duplicating machine. 4,030,412, Cl. 101-132.000.

Spry, Douglas O.: *See—*
Kukolja, Stjepan; and Spry, Douglas O., 4,031,084.

Spulgis, Ivars Sigurds: *See—*
Parish, Harold Cheney; Allard, Michael Duane; Pettit, Jack Leland; and Spulgis, Ivars Sigurds, 4,030,639.

Square D Company: *See—*
Atwood, Felix M., 4,030,364.
Rozenboom, Gustave; and Rickmann, Bernard C., 4,030,794.
Vidoni, John; Lingaraju, Bhartoor; and Timmins, John C., 4,030,800.

Stabilus GmbH: *See—*
Freitag, Herbert, 4,030,716.

Stables, Wilbur Leon: *See—*
Weiss, William Robert; Cooksey, James Judson; Stables, Wilbur Leon; and Newell, Harry Lee, Jr., 4,030,651.

Stachowiak, Claude R., to Boeing Company, The. Jet engine thrust reverser. 4,030,290, Cl. 60-226.00A.

Stackman, Robert W.: *See—*
Conciatori, Anthony B.; and Stackman, Robert W., 4,030,933.
Conciatori, Anthony B.; and Stackman, Robert W., 4,031,063.

Stahle, Helmut: *See—*
Koppe, Herbert; Zeile, Karl; Kummer, Werner; Stahle, Helmut; and Danneberg, Peter, 4,031,244.

Stahlke, Kurt-Rainer; Krafft, Werner; Meyer, Rudolf; and Rosenkranz, Hans Jurgen, to AGFA-Gevaert, A.G. Light-sensitive material containing a dye-forming combination of a heterocyclic compound and a cyclic dihalodicarbonyl compound in a polymeric binder. 4,030,926, Cl. 96-90.00R.

Staiger, Donald W.: *See—*
Myers, Gary L.; and Staiger, Donald W., 4,030,186.

Stait, Donald Peter; and Zenger, Willi, to Contraves AG. Syringe for injecting liquids into blood vessels of living bodies. 4,030,496, Cl. 128-215.000.

Stamicarbon B.V.: *See—*
Otter, Marinus J.A.M. Den; Nijenhuis, Anne Te; and Van Geenen, Albert A., 4,031,040.

Stanasila, Virgil Corneliu; Florica, Mihai; and Lungu, Onut Antoniu, to Institutul de Cercetare Proiectare si Documentare Pentru Industria Materialelor de Constructii. Apparatus for drying ceramic bodies. 4,030,879, Cl. 432-144.000.

Standard Conveyor Company: *See—*
Krammer, Robert, 4,030,423.

Standard Oil Company (Indiana): *See—*
Sabol, Albert R., 4,031,017.

Standlick, Ronald E. Variable proportional metering apparatus. 4,030,860, Cl. 417-63.000.

Stanik, Carol: *See—*
Mandras, Christian Maurice; and Stanik, Carol, 4,030,680.

Stanislawczyk, John P., to Raymond Lee Organization, Inc., The, a part interest. Anti-theft transmission lever lock plate. 4,030,323, Cl. 70-199.000.

Stanley, Thomas Osborne, to RCA Corporation. Flat cathode ray tube. 4,031,427, Cl. 313-422.000.

Stanley Works, The: *See—*
Lambertz, Martin R.; and Fiorelli, Maria, 4,030,160.

Stapler, W. Mead. Open stream velocity probe and meter. 4,030,359, Cl. 73-231.00R.

Starkweather, William H., to Sigma Chemical Company. Alkaline phosphatase isoenzyme determination. 4,030,995, Cl. 204-180.00G.

Stauffer Chemical Company: *See—*
Arneklev, Duane R.; and Baker, Don R., 4,030,911.
Baker, Don R., 4,031,241.
Goswami, Jagadish Chandra, 4,031,045.
Jin, Jung Il, 4,031,054.
Wei, Chung H., 4,031,299.

Stebbins, Robert C.; Allen, Brockenbrough S.; and Brown, Charles. Method of and means for demonstrating evolution including chance determinations. 4,030,210, Cl. 35-20.000.

Stecklein, Alfred L., to Gates Rubber Company, The. Integrally molded belt with working element attached thereto. 4,030,276, Cl. 56-291.000.

Steel Web Corporation: *See—*
Jackson, Edgar D., 4,030,264.

Steffek, Robert J.: *See—*
Hunt, Robert P.; and Steffek, Robert J., 4,031,400.

Stein, Jay A.; and Annis, Martin, to American Science & Engineering, Inc. Radiant energy alarm system. 4,031,545, Cl. 358-108.000.

Steinbrecher, Lester: *See—*
Hall, Wilbur S.; and Steinbrecher, Lester, 4,030,945.

Steiner, Anton, to Semperit Aktiengesellschaft. Apparatus for cutting conveyed materials. 4,030,393, Cl. 83-318.000.

Steinigeweg, Rosmarie: *See—*
Gottschlich, Rudolf; Rogalski, Werner; Bergmann, Rolf; Steinigeweg, Rosmarie; and Wahlig, Helmut, 4,031,230.

Stelmakh, Viktor Alexeevich: *See—*
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Stemler, Orrin A.: *See—*
Cobb, Deiwin E.; Jackson, George J.; Livesay, Richard E.; and Stemler, Orrin A., 4,030,566.

Stenemann, Heinrich F., to Minnesota Mining and Manufacturing Company. Pavement-striping apparatus. 4,030,958, Cl. 156-350.000.

Stenkvist, Sven-Einar: *See—*
Fredrickson, Bengt; and Stenkvist, Sven-Einar, 4,031,308.

Sterling Drug Inc.: *See—*
Ackerman, James H., 4,031,088.
Collins, Joseph C.; and Diana, Guy D., 4,031,246.

Sterner, John Franklin, to RCA Corporation. SCR, diode, diac, and triac tester. 4,031,465, Cl. 324-158.0SC.

Sterzel, Hans-Josef: *See—*
Cordes, Claus; and Sterzel, Hans-Josef, 4,031,065.

Stevens, Jack D. Pulse rate monitoring device. 4,030,483, Cl. 128-2.05T.

Stevens, Wilhelm-Josef: *See—*
Straeten, Franz-Josef; Pelzer, Rudolf; Feiten, Karl-Josef; and Stevens, Wilhelm-Josef, 4,030,961.

Stober!, Helmuth. Foldable outboard seat for sailboats. 4,030,436, Cl. 114-39.000.

Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., to Stock Equipment Company. Process for introducing particulate material into a container. 4,030,708, Cl. 259-8.000.

Stock Equipment Company: *See—*
Stock, Arthur J.; Christofer, Donald E.; and Brinza, Joseph E., 4,030,708.

Stockel, Richard Frederick; and Valenti, Peter Carl, to National Patent Development Corporation. Method of preparing 3,3-Bis (chloromethyl) oxetane. 4,031,110, Cl. 260-333.000.

Stockwell, Guy N., to United States of America, Army. Segmented map and holder. 4,030,218, Cl. 40-102.000.

Stoelting Company: *See—*
Kuska, Walter J.; and McGowan, Edward J., Jr., 4,030,484.

Stork, Karl: *See—*
Oppenlaender, Knut; Uhl, Guenter; Helfert, Herbert; Scharpenberg, Hans-Georg; and Stork, Karl, 4,031,112.

Strachan & Henshaw Limited: *See—*
Evans, David Arthur, 4,030,574.

Straeten, Franz-Josef; Pelzer, Rudolf; Feiten, Karl-Josef; and Stevens, Wilhelm-Josef, to Saint-Gobain Industries. Device for assembling glass sheets and layers of plastic material. 4,030,961, Cl. 156-580.000.

Strahm, Charles, to Mount Royal Transportation Equipment Ltd. Diesel cab seat assembly. 4,030,749, Cl. 297-345.000.

Straubel, Reinhard: *See—*
Volz, Horst; Straubel, Reinhard; and Hager, Arnulf, 4,031,525.

Strauss, Eric L., to Martin Marietta Corporation. Low density ablator compositions. 4,031,059, Cl. 260-37.0SB.

Strebel, Elwood L., to Minnesota Mining and Manufacturing Company. Lyotropic birefringent films. 4,030,812, Cl. 350-157.000.

Strebel, Elwood L., to Minnesota Mining and Manufacturing Company. 1,3-Bis-(carboxy-phenylamino)-s-triazines. 4,031,092, Cl. 260-249.600.

Strehler, John Frederick; Mikoliczeak, John Joseph; and Strehler, Kirk Robert. Method and apparatus for preserving biological materials. 4,030,314, Cl. 62-65.000.

Strehler, Kirk Robert: *See—*
Strehler, John Frederick; Mikoliczeak, John Joseph; and Strehler, Kirk Robert, 4,030,314.

Streisand, Kenneth: *See—*
Dudonis, Ronald Michael; Morrison, Charles Glenn; Potter, Robert Lawrence; and Streisand, Kenneth, 4,031,325.

Strizhenko, Vitaly Evgenievich: *See—*
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Strohmaier, Alfred John: *See—*
Holfeld, Winfried Thomas; and Strohmaier, Alfred John, 4,030,880.

Strong, Jerry G., to Mobil Oil Corporation. N-[3-(4-Methyl-3-cyclohexenyl)butyl]amines and their use as plant growth regulators. 4,030,908, Cl. 71-78.000.

Strupczewski, Joseph: *See—*
Helsley, Grover C.; and Strupczewski, Joseph, 4,031,221.

Struttmann, Hilarius S.: *See—*
Robinson, Elmer D.; and Struttmann, Hilarius S., 4,030,785.

Strydio, George C.: *See—*
Weller, John V. C.; Strydio, George C.; and Vits, Helmuth, 4,031,280.

Stute, Manfred; and Tank, Eggert, to Daimler-Benz Aktiengesellschaft. Cross-current pipe heat-exchanger for gases. 4,030,539, Cl. 165-134.000.

Suda, Kazuyoshi; Isono, Tomoyuki; Uchida, Takashi; and Tsuda, Kiyoshi, to Nippon Electric Co., Ltd. Flat-article separating apparatus for an automatic mail handling system and the like. 4,030,607, Cl. 209-74.00R.

Suda, Seiji: *See—*
Sugiura, Noboru; Mori, Yasunori; and Suda, Seiji, 4,030,468.

Sugai, Tetuya: *See—*
Kojima, Kojiro; Sakurai, Yoshihisa; Sugai, Tetuya; and Motegi, Masayoshi, 4,030,837.

Sugasawa, Tsutomu, to Shionogi & Co., Ltd. Camptothecin analogues. 4,031,098, Cl. 260-287.00C.

Sugimoto, Masao: *See—*
Nobutoki, Saburo; Ogusu, Chihaya; and Sugimoto, Masao, 4,031,551.

Sugimoto, Takeshige. Method of water admixing to fuel oil for an internal combustion engine and apparatus therefor. 4,030,453, Cl. 123-3.000.

Sugiura, Kensuke; Kagaya, Mineo; Fujisou, Tokuo; Aoki, Hiroyuki; Takehara, Takeichiro; and Kurata, Shigenori, to Nippon Oil Company, Ltd.; and Nissan Motor Co., Ltd. Central system fluid composition. 4,031,020, Cl. 252-56.00R.

Sugiura, Noboru; Mori, Yasunori; and Suda, Seiji, to Hitachi, Ltd. Ignition system for internal combustion engines. 4,030,468, Cl. 123-148.00E.

Sukolics, Ronald D.; and Biebuyck, Lawrence F., to Kawneer Company, Inc. Wall construction. 4,030,260, Cl. 52-397.000.

Suld, George; Schneider, Abraham; and Myers, Harry K., Jr., to Suntech, Inc. Catalytic dimerization of norbornadiene to Binor-S. 4,031,150, Cl. 260-666.0PY.

Sullivan, John F.; Konstance, Richard P.; and Heiland, Wolfgang K., to United States of America, Agriculture. Doctoring and drying method. 4,031,252, Cl. 426-445.000.

Sullivan, Kevin J., to Corning Glass Works. Fluid application device. 4,030,341, Cl. 73-61.10C.

Suminokura, Tatsuo: *See—*
Murai, Hiromu; Kitaguchi, Koji; Suminokura, Tatsuo; Sano, Akira; Kise, Masahiro; Kitano, Masahiko; and Tomita, Toshio, 4,031,303.

Sumitomo Chemical Company, Limited: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,031,235.
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 4,031,134.
Shirayama, Kenzo; Kita, Shinichiro; and Fujimoto, Masanori, 4,031,062.

Sumitomo Durez Company, Ltd.: *See—*
Nakamura, Nobutaka; and Saeki, Yukio, 4,031,276.

Sumiyoshi, Hiroji; and Chiba, Tomosuke, to Sony Corporation. Implosion-resistant cathode ray tube with protective assembly for its face plate. 4,031,553, Cl. 358-247.000.

Sun Oil Company of Pennsylvania: *See—*
Etheridge, Jay D., 4,030,369.

Sunderlage, Gerald N.: *See—*
Bricknell, William H.; and Sunderlage, Gerald N., 4,030,776.

Sundermann, Rudolf; Rottloff, Gunther; and Grigat, Ernst, to Bayer Aktiengesellschaft. Polytriazines and a process for their production. 4,031,067, Cl. 260-77.50R.

Sung, Pei; and Schweder, Frederic James, to Johnson & Johnson. Indium containing dental alloy powder. 4,030,918, Cl. 75-134.00B.

Suntech, Inc.: *See—*
Suld, George; Schneider, Abraham; and Myers, Harry K., Jr., 4,031,150.

Suortti, Mikko Tapani; Malkki, Yrjo; and Nikkila, Olavi Elis, to Suortti, Mikko Tapani; and Malkki, Yrjo. Procedure for preserving root crops by deep freezing and their peeling. 4,031,253, Cl. 426-482.000.

Superba S.A.: *See—*
Gloeckler, Alfred, 4,030,319.

Suyderhoud, Henri George: *See—*
Campanella, Samuel Joseph; Dodel, Hans; and Suyderhoud, Henri George, 4,031,338.

Suzuki, Kazuo; Hayashi, Yoshiaki; and Nagamine, Seiichi, to Kanegafuchi Chemical Industries Co., Ltd. Self-bonding insulated wire. 4,031,287, Cl. 428-379.000.

Suzuki, Osamu; Akashi, Goro; Kasuga, Akira; and Sega, Kenji, to Fuji Photo Film Co., Ltd. Magnetic tape magazine. 4,030,685, Cl. 242-199.000.

Suzuki, Tadao; Yoshida, Tadao; and Wachi, Shigeaki, to Sony Corporation. Transistor inverter. 4,031,454, Cl. 321-2.000.

Suzuki, Yoshitake: *See—*
Ito, Yasuo; and Suzuki, Yoshitake, 4,030,534.
Itoh, Yasuo; Suzuki, Yoshitake; Shibutami, Hirohiko; Hirano, Koichi; and Tagami, Muneo, 4,030,533.

Svec, Frantisek: *See—*
Kalal, Jaroslav; Coupek, Jiri; Pokorny, Svatopluk; Svec, Frantisek; and Bouchal, Karel, 4,031,037.

Swanson, James P.; and Nyquist, Stephen E., to W. A. Whitney Corporation. Punch press with hydraulically actuated stripper. 4,030,391, Cl. 83-137.000.

Swanson, Kermit E.; and Kuzel, Frank J., to R. R. Donnelley & Sons Company. Compensating stacker for magazines. 4,030,621, Cl. 214-6.500.

Swift and Company Limited: *See—*
Ramirez, Ernest R.; and Johnson, Dennis L., 4,031,006.

Swinehart, Carl F.: *See—*
Hammond, David A.; and Swinehart, Carl F., 4,030,965.

Swiss Aluminium Ltd.: *See—*
Liebetrau, Richard E.; and Miller, Larry J., 4,030,609.
Wagner, Alfred; and Kidratschky, Hermann, 4,030,334.

Switack, Elva Jane: *See—*
Switack, John; and Switack, Elva Jane, 4,030,646.

Switack, John; and Switack, Elva Jane. Survival belt/bag. 4,030,646, Cl. 224-9.000.

Swonger, Kenneth D.: *See—*
Freeman, John D.; Robinson, Ralph C.; and Swonger, Kenneth D., 4,031,363.

Symons Corporation: *See—*
Cody, David L., 4,030,266.
Schimmel, Vernon R., 4,030,694.

Syntex (U.S.A.) Inc.: *See—*
Beard, Colin C., 4,031,228.
Beard, Colin C.; Edwards, John A.; and Fried, John H., 4,031,234.

Synthelabo: *See—*
Giudicelli, Don Pierre Rene Lucien; and Najer, Henry, 4,031,094.

Szente, Andre, to Hoffmann-La Roche Inc. Benzodiazepine derivatives. 4,031,078, Cl. 260-239.30D.

Szilagyi, Jane M., to Delbar Products, Inc. Mirror mounting structure. 4,030,692, Cl. 248-487.000.

T.W. Jesty & Partners: *See—*
Jesty, Thomas William; Anderson, John; and 53, 4,030,407.

Tagami, Muneo: *See—*
Itoh, Yasuo; Suzuki, Yoshitake; Shibutami, Hirohiko; Hirano, Koichi; and Tagami, Muneo, 4,030,533.

Tagliaferri, Giovanni: *See—*
Barba, Diego; Germana, Antonino; Liuzzo, Giuseppe; and Tagliaferri, Giovanni, 4,030,985.

Takahama, Ryuichiro: *See—*
Nagata, Toshio; Kawasaki, Kunijiro; Takahama, Ryuichiro; Miyatani, Yoshifusa; and Funakoshi, Sozo, 4,030,441.

Takahashi, Isoji, to Fuji Photo Film Co., Ltd. Electrostatic image forming method. 4,031,269, Cl. 427-24.000.

Takahashi, Toru; Nakahata, Kimio; and Kadowaki, Hidejiro, to Canon Kabushiki Kaisha. Developing device. 4,030,447, Cl. 118-658.000.

Takeda Chemical Industries, Ltd.: *See—*
Nose, Yukihiko, 4,031,010.

Takeda, Takashi: *See—*
Okamura, Yasushi; Tanaka, Kiichiro; and Takeda, Takashi, 4,031,337.

Takehara, Takeichiro: *See—*
Sugiura, Kensuke; Kagaya, Mineo; Fujisou, Tokuo; Aoki, Hiroyuki; Takehara, Takeichiro; and Kurata, Shigenori, 4,031,020.

Takenaga, Hisayoshi; and Yotsukura, Teruo, to Hitachi, Ltd. Multicolor developing device. 4,030,445, Cl. 118-645.000.

Takeshita, Tetsuo: *See—*
Ohhinata, Ichiro; Okuhara, Shinzi; and Takeshita, Tetsuo, 4,031,413.

Takeuchi, Yoshihiko: *See—*
Saiki, Noritsugu; Takeuchi, Yoshihiko; and Sakai, Hiroshi, 4,031,165.

Tamamura, Akira: *See—*
Fukui, Kiyoshige; Tamamura, Akira; and Nishimoto, Minoru, 4,030,725.

Tanaka, Kiichiro: *See—*
Okamura, Yasushi; Tanaka, Kiichiro; and Takeda, Takashi, 4,031,337.

Tanaka, Minoru; and Otaka, Syoichi, to Honda Giken Kogyo Kabushiki Kaisha. Ignition timing control apparatus for internal combustion engine. 4,030,460, Cl. 123-117.00A.

Tanaka, Mitsuo: *See—*
Onishi, Makoto; Nagano, Katsuyuki; Tanaka, Toshiki P.; Matsuoka, Sadao; and Tanaka, Mitsuo, 4,030,809.

Tanaka, Toshiki P.: *See—*
Onishi, Makoto; Nagano, Katsuyuki; Tanaka, Toshiki P.; Matsuoka, Sadao; and Tanaka, Mitsuo, 4,030,809.

Tanaka, Yoshihiro: *See—*
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 4,031,134.

Taneda, Yukinori; and Kobayashi, Takashi, to Hitachi, Ltd. Reciprocal transfer apparatus. 4,030,614, Cl. 214-1.0BT.

Tani, Tadaaki, to Fuji Photo Film Co., Ltd. Supersensitizing combinations of halogen substituted benzotriazoles and cyanine dyes. 4,030,927, Cl. 96-100.000.

Tanifuji, Shinya: *See—*
Morooka, Yasuo; and Tanifuji, Shinya, 4,030,326.

Taniguchi, Isao, to Nippon Piston Ring Co., Ltd. Chrome insert ring. 4,030,767, Cl. 277-235.00R.

Taniguchi, Ken: *See—*
Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Ashita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, 4,030,977.

Taniguchi, Satoshi: *See—*
Fujiwara, Hideo; Ichinose, Yukio; Taniguchi, Satoshi; Kobayashi, Tsutomu; Ichino, Kazuo; Itoh, Michiyasu; Uesaka, Yasutaro; Inose, Fumiyuki; and Ueno, Sadayasu, 4,031,496.

Taniyasu, Ryozo: *See—*
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; Taniyasu, Ryozo; and Nagayama, Masuzo, 4,031,158.

Tank, Eggert: *See—*
Stute, Manfred; and Tank, Eggert, 4,030,539.

Tarasova, Valentina Mikhailovna: *See—*
Shults, Mikhail Mikhailovich; Parfenov, Anatoly Ivanovich; Shnypikov, Alexandr Dmitrievich; Krunchak, Vladimir Georgievich; Evnina, Sarra Borisovna; Dolidze, Vladimir Alexandrovich; and Tarasova, Valentina Mikhailovna, 4,030,93 .

Tatarintsev, Vladimir Mikhailovich: *See—*
Alexandrov, Vladimir Ilich; Osiko, Vyacheslav Vasilievich; Muraviev, Ernest Nikolaevich; Spiridonov, Eduard Georgievich; Tatarintsev, Vladimir Mikhailovich; and Gordon, Vladimir Grigorievich, 4,030,891.

Tattermusch, Peter: *See—*
Kleinschmit, Einhard; Tattermusch, Peter; and Haverbeck, Gunther, 4,030,714.

Tatzel, Hermann; Koegel, Wolfram; Beck, Gilbert; Zuern, Ludwig; and Caesar, Arndt Christian, to BASF Aktiengesellschaft. Manufacture of shaped articles of foamed olefin polymers. 4,031,179, Cl. 264-91.000.

Taylor, William I.: *See—*
Sanders, James Milton; Taylor, William I.; Hill, Ira D.; and Kryschuk, John J., 4,031,161.

Technical Industries, Inc.: *See—*
Jaquith, Burton Kent, 4,030,356.

Technovators, Inc.: *See—*
Fisher, Glen W., 4,030,633.

Teijin Limited: *See—*
Saiki, Noritsugu; Takeuchi, Yoshihiko; and Sakai, Hiroshi, 4,031,165.

Tekonsha Engineering Company: *See—*
Eden, Edward Joseph, 4,030,756.

Tektronix, Inc.: *See—*
Fessler, Jon Leroy, 4,030,838.

Telesco Brophey Limited: *See—*
Weber, Heinz, 4,030,515.

Teletype Corporation: *See—*
Heeren, Richard H., 4,031,524.

Telfer, Ian Edmund, to British Petroleum Company Limited, The. Ships for liquid cargoes. 4,030,438, Cl. 114-74.00R.

Telic Corporation: *See—*
Penfold, Alan S.; and Thornton, John A., 4,030,996.
Penfold, Alan S.; and Thornton, John A., 4,031,424.

Templeton, William B.: *See—*
Wallace, Harry L.; and Templeton, William B., 4,030,728.

Tenczar, Francis. Fluid connectors. 4,030,494, Cl. 128-214.00R.

Tenneco Chemicals, Inc.: *See—*
Di Bella, Eugene P., 4,031,144.
Di Bella, Eugene P., 4,031,145.
Di Bella, Eugene P., 4,031,146.
Patel, Piyush J.; and Miringoff, William, 4,031,056.

Tennes, Bernard R.; and Burton, Clyde L., to United States of America, Agriculture. Metering and spray apparatus for horticultural applications. 4,030,244, Cl. 47-1.700.

Terashima, Hiroshi: *See—*
Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Aishita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, 4,030,977.

Tertykh, Valentin Anatolievich: *See—*
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Khaber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.

Terzian, Rouben T.; Schoenfield, Palmer J.; Dunn, Kathy A.; and Kuna, Wayne A., to Marvin Glass & Associates. Toy play kit. 4,030,235, Cl. 46-11.000.

Tessler, Arthur N., to Calculus Instruments Ltd. Method and device for disintegrating stones in human ducts. 4,030,505, Cl. 128-328.000.

Teuling, Dirk Johan Adriaan, to U.S. Philips Corporation. Triggered transistor switching regulator. 4,031,453, Cl. 321-2.000.

Tex International, S.A.: *See—*
Kiener, Christian, 4,030,526.

Texaco Development Corporation: *See—*
Nieh, Edward C. Y.; and Moss, Philip H., 4,031,138.

Texaco Inc.: *See—*
Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,030,981.
Owens, Gary D., 4,031,505.

Texas Instruments Incorporated: *See—*
Ehni, George John, III; and Leuschner, Horst, 4,031,474.
Redwine, Donald J.; and Kitagawa, Norishisa, 4,031,415.

Thalen, Hilbert J. Th., to Vitatron Medical B.V. Low output electrode for cardiac pacing. 4,030,508, Cl. 128-418.000.

Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., to Exxon Research and Engineering Company. High molecular weight, high unsaturation isobutylene-cyclopentadiene copolymers. 4,031,300, Cl. 526-308.000.

Theodore, Frank W.: *See—*
Gorin, Everett; Jasulaitis, William A.; Theodore, Frank W.; and Wasson, George E., 4,030,982.

Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, to Bayer Aktiengesellschaft. Process for preparing pure 1-nitroanthraquinone. 4,031,116, Cl. 260-369.000.

Thiessen, Fritz: *See—*
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Lebert, Ulrich; and Thiessen, Fritz, 4,031,135.

Thomas, Erwin: *See—*
Rapp, Guenther; Fuchs, Hugo; and Thomas, Erwin, 4,031,139.

Thomas, Ian M., to Owens-Illinois, Inc. Method for the manufacture of borosilicate glasses. 4,030,938, Cl. 106-73.500.

Thomas Industries of Tennessee, Inc.: *See—*
Ware, William P.; and Wheeler, Robert D., 4,030,702.

Thomas J. Lipton, Inc.: *See—*
Reid, Joanne; de la Teja, Elpidio Leoncio; and Farrell, Francis, 4,031,238.

Thomas, James L., to FMC Corporation. Rigid polyvinyl chloride compositions with high heat-deflection temperatures. 4,031,061, Cl. 260-42.290.

Thomas, Virgil E., Jr.; and Quist, Donald G., to United States of America, Navy. Peak detecting demodulator. 4,031,479, Cl. 329-50.000.

Thompson-Hayward Chemical Co.: *See—*
McNall, Lester Ray, 4,030,907.

Thompson, William C. Power generating system. 4,030,300, Cl. 60-639.000.

Thomson-CSF: *See—*
Butin, Henri; and Deman, Pierre, 4,031,327.
Deman, Pierre, 4,031,326.
Felix, Pierre; Gamot, Philippe; Moiroud, Guy; and Veron, Serge, 4,031,394.
Rannou, Jean, 4,031,487.

Thornley, Brian Robert, to Plessey Handel und Investments A.G. Optical code readers. 4,031,358, Cl. 235-61.11E.

Thornton, Charles: *See—*
Labie, Allan S.; Thornton, Charles; Lew, Irwin Paul; and Gutman, Abraham, 4,030,257.

Thornton, John A.: *See—*
Penfold, Alan S.; and Thornton, John A., 4,030,996.
Penfold, Alan S.; and Thornton, John A., 4,031,424.

Thrower, William F.: *See—*
Lee, Don H.; Weller, Kenneth P.; and Thrower, William F., 4,030,943.

Thurne Engineering Company Limited: *See—*
Payne, Richard, 4,030,268.

Tiberg, Lars, to Fagersta AB. Method for casting steel ingots. 4,030,532, Cl. 164-66.000.

Tichy, Dieter: *See—*
Schnee, Karl; Tichy, Dieter; and Piesch, Steffen, 4,031,064.

TIDO Chemisch-technische Produkte GmbH, Firma: *See—*
Tisza, Julianna, 4,031,046.

Timex Corporation: *See—*
Wuthrich, Paul; and Mascia, Frank P., 4,031,341.

Timmers, Leonardes August: *See—*
Pickert, Hansjurgen; Sesselmann, Hans Dieter; and Timmers, Leonardes August, 4,030,430.

Timmins, John C.: *See—*
Vidoni, John; Lingaraju, Bhartoor; and Timmins, John C., 4,030,800.

Tinney, Francis John, to Parke, Davis & Company. Tetrapeptides. 4,031,070, Cl. 260-112.5LH.

Tinney, Francis John: *See—*
Nicolaides, Ernest D.; Tinney, Francis John; and French, James Clark, 4,031,069.

Tisbo, Cosmo N.; and Tisbo, Thomas A., to Custom Plastics, Inc. Spraying and watering can. 4,030,664, Cl. 239-289.000.

Tisbo, Thomas A.: *See—*
Tisbo, Cosmo N.; and Tisbo, Thomas A., 4,030,664.

Tisza, Julianna, to TIDO Chemisch-technische Produkte GmbH, Firma. Exothermic lining for metallurgical purposes and method of making the same. 4,031,046, Cl. 260-17.200.

Toa Medical Electronics Co., Ltd.: *See—*
Yamamoto, Hiroshi; and Oka, Masaaki, 4,030,888.

Tobias, Michael A.: *See—*
Gough, Stanley T.; Tobias, Michael A.; and Napier, Roger P., 4,031,237.

Tocci, Leonard R.: *See—*
Archer, John L.; Tocci, Leonard R.; and Williams, Jeffrey L., 4,031,526.

Tocquet, Bernard: *See—*
Cluzel, Philippe; Quivy, Michel; and Tocquet, Bernard, 4,031,418.

Togo, Masaaki; Shima, Masao; and Mochizuki, Kiyoshi, to Yamatake-Honeywell Company Limited. Improved control system for energizing a stepping motor. 4,031,447, Cl. 318-685.000.

Tohru, Uchida: *See—*
Akira, Kato; Akira, Itoh; Tohru, Uchida; and Masao, Ishihara, 4,030,921.

Tojo, Eigo: *See—*
Nakayama, Michio; and Nakayama, Setuko, 4,031,262.

Tokico Ltd.: *See—*
Hayashida, Yoshihiro, 4,030,758.

Tokorozawa Electronic Corporation: *See—*
Itagaki, Tadasi, 4,030,564.

Tokudome, Katsumi; and Hattori, Shuzo, to Kimmon Electric Co., Ltd. Discharge tube having multiple electrodes arranged in tandem. 4,031,428, Cl. 315-111.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Anno, Gousuke, 4,031,008.
Kokado, Naoyuki; and Makino, Shinichi, 4,031,470.

Tominaga, Anri: *See—*
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; Taniyasu, Ryozo; and Nagayama, Masuzo, 4,031,158.
Mandai, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; and Sato, Michito, 4,031,159.

Tominaga, Yoichi; and Shibahara, Yasuo, to Sanyo Chemical Industries, Ltd. Surface sizing of paper with an acrylic copolymer where scum formation is minimized. 4,030,970, Cl. 162-168.00R.

Tomita, Toshio: *See—*
Murai, Hiromu; Kitaguchi, Koji; Suminokura, Tatsuo; Sano, Akira; Kise, Masahiro; Kitano, Masahiko; and Tomita, Toshio, 4,031,303.

Tompkins, Douglas L., to Baxter Travenol Laboratories, Inc. Syringe. 4,030,498, Cl. 128-218.00P.

Tone, Junsuke: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,031,206.

Toneray Covers, Inc.: *See—*
Petretti, Raymond H., 4,030,780.

Torin Corporation: *See—*
Collins, Charles P.; and Lampietti, Bernard P., 4,030,327.

Toro Company, The: *See—*
Christopherson, Herman P., 4,030,277.

Torres, Lorenzo. Can slitting device. 4,030,392, Cl. 83-178.000.

Torrington GmbH: *See—*
Eckhardt, Hellmuth, 4,030,170.

Toyo Kogyo Co., Ltd.: *See—*
Yamamoto, Kenichi; Kirose, Yutaka; and Maeda, Tooru, 4,030,454.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Shimizu, Akihiko; and Sakanaka, Yasuhiro, 4,031,302.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Yamaguchi, Shunzo; Ozaki, Tadashi; and Konomi, Toshiaki, 4,030,464.

Trascandica AG: *See—*
Bengtsson, Bo Gunnar, 4,030,437.

Traunecker, Werner: *See—*
Losel, Walter; Traunecker, Werner; and Hoefke, Wolfgang, 4,031,212.
Trautvetter, Werner: *See—*
Vollkommer, Norbert; and Trautvetter, Werner, 4,031,163.
Treffinger, H. Lee: *See—*
Groudan, Alan I.; Schroeder, George F.; and Treffinger, H. Lee, 4,031,374.
Treiber, James H.: *See—*
Christian, Edward H.; Mains, Donald M.; and Treiber, James H., 4,031,440.
Trieschmann, Hans-Georg: *See—*
Bronstert, Klaus; Fahrbach, Gerhard; Krahe, Eduard; Ladenberger, Volker; Kastning, Ernst-Guenther; Mittnacht, Hans; Willersinn, Herbert; and Trieschmann, Hans-Georg, 4,031,166.
Triffterer, Adolf: *See—*
Frey, Jurgen; Weber, Andreas; and Triffterer, Adolf, 4,030,463.
Trio Electronics Incorporated: *See—*
Mitarai, Kaoru, 4,031,473.
Tritten, Paul: *See—*
Auriol, Alain; and Tritten, Paul, 4,031,177.
Trombly, John E., to Arthur D. Little, Inc. Electromagnetically coupled battery charger. 4,031,449, Cl. 320-2.000.
Trombly, John E.: *See—*
Perron, Robert Richard; and Trombly, John E., 4,031,434.
Tronstad, Knut, to Aksjeselskapet Jotul. Fireplace. 4,030,475, Cl. 126-121.000.
Troyer, Terrance J.: *See—*
Phillips, James W.; and Troyer, Terrance J., 4,030,365.
Truax, James R. Native grass seed drill. 4,030,428, Cl. 111-85.000.
TRW Inc.: *See—*
Glorioso, Paul A., 4,031,349.
Tsuda, Kiyoshi: *See—*
Suda, Kazuyoshi; Isono, Tomoyuki; Uchida, Takashi; and Tsuda, Kiyoshi, 4,030,607.
Tsurushima, Katsuaki, to Sony Corporation. Bias circuit for FET. 4,031,482, Cl. 330-35.000.
Tucker, Terry A.: *See—*
Rice, Jeffrey C.; and Tucker, Terry A., 4,031,531.
Tull, Roger J.: *See—*
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 4,031,125.
Tuominen, Tapio Kalevi: *See—*
Aaltonen, Olavi August; Andersson, Bengt Torsten; Juusela, Jyrki Tapani; Palperi, Matti Johannes; and Tuominen, Tapio Kalevi, 4,030,915.
Turney, Larry R., to Victor Equipment Company. Floating tube torch. 4,030,710, Cl. 266-48.000.
Uchida, Takashi: *See—*
Suda, Kazuyoshi; Isono, Tomoyuki; Uchida, Takashi; and Tsuda, Kiyoshi, 4,030,607.
Ueno, Sadayasu: *See—*
Fujiwara, Hideo; Ichinose, Yukio; Taniguchi, Satoshi; Kobayashi, Tsutomu; Ichino, Kazuo; Itoh, Michiyasu; Uesaka, Yasutaro; Inose, Fumiyuki; and Ueno, Sadayasu, 4,031,496.
Uesaka, Yasutaro: *See—*
Fujiwara, Hideo; Ichinose, Yukio; Taniguchi, Satoshi; Kobayashi, Tsutomu; Ichino, Kazuo; Itoh, Michiyasu; Uesaka, Yasutaro; Inose, Fumiyuki; and Ueno, Sadayasu, 4,031,496.
Uhl, Guenter: *See—*
Oppenlaender, Knut; Uhl, Guenter; Helfert, Herbert; Scharpenberg, Hans-Georg; and Stork, Karl, 4,031,112.
Uhl, Wyman F.: *See—*
Antonio, Christo; and Uhl, Wyman F., 4,030,955.
Uhring, Gary S.: *See—*
Hood, Frederick E.; Mitchell, Donald K.; and Uhring, Gary S., 4,030,439.
Ukai, Toshinao: *See—*
Noguchi, Yasuhiro; Ukai, Toshinao; Sashihara, Kenji; and Masuda, Takao, 4,030,931.
Ukigai, Toshiyuki: *See—*
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; Taniyasu, Ryozo; and Nagayama, Masuzo, 4,031,158.
Mandai, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anri; and Sato, Michito, 4,031,159.
Umeda, Tomoyoshi; and Haraguchi, Yoshimasa, to Beltek Corporation. Magnetic recording and reproducing apparatus. 4,031,554, Cl. 360-73.000.
Umehara, Hidetoshi: *See—*
Asao, Makoto; Ito, Susumu; and Umehara, Hidetoshi, 4,031,171.
Umholtz, Franklyn G., to Russell Harrington Cutlery, Inc. Mat cutter for circles. 4,030,192, Cl. 30-310.000.
Ungnadner, Peter: *See—*
Geisslinger, Wolfgang; and Ungnadner, Peter, 4,030,818.
Union Carbide Corporation: *See—*
Prokai, Bela; and Kanner, Bernard, 4,031,042.
Union Industrielle et D'Entreprise: *See—*
Heimke, Wolfram, 4,030,699.
Heimke, Wolfram, 4,030,755.
Uniroyal Inc.: *See—*
Cantor, Stephen E., 4,031,068.
Morris, Harris L., 4,031,169.
Unit Rig & Equipment Co.: *See—*
Satterwhite, Charles R., 4,030,217.
United Chemi-Con, Inc.: *See—*
Alwitt, Robert S., 4,031,436.
United Glass, Ltd.: *See—*
Battye, Christopher John; and Dorey, Roger John, 4,030,904.
United States of America
Agriculture: *See—*
Bell, Edward W., 4,031,019.
Folk, Craig L.; and Kotter, James I., 4,030,280.
Guadagni, Dante G.; Horowitz, Robert M.; Gentili, Bruno; and Maier, Vincent P., 4,031,265.
Sullivan, John F.; Konstance, Richard P.; and Heiland, Wolfgang K., 4,031,252.
Tennes, Bernard R.; and Burton, Clyde L., 4,030,244.
Air Force: *See—*
Lawton, Robert A.; and Andrews, James R., 4,030,840.
Smith, Tennyson, 4,030,836.
Army: *See—*
Bosserman, David A.; and Freeman, Charles F., 4,031,552.
Caruso, Frank, 4,031,501.
Hyde, George S., 4,030,850.
Redman, Charles M., 4,031,393.
Regber, Norman; Dukic, Ferdinando V.; and Diorio, Frank, 4,030,418.
Stockwell, Guy N., 4,030,218.
Vinansky, George, Jr.; and Lucia, Emmanuel A., 4,031,301.
Westell, William E., 4,030,817.
Zeigler, Edward H., 4,031,172.
Energy Research and Development Administration: *See—*
Alvis, Robert L.; and Newsom, Melvin M., 4,030,557.
Bauer, Martin L.; Johnson, Wayne F.; and Lakomy, Dale G., 4,030,834.
Gibson, Edwin D.; and Verhoeven, John D., 4,030,963.
Lattin, Kenneth R., 4,031,387.
Schieber, Michael M.; Beinglass, Israel; and Dishon, Giora, 4,030,964.
Health, Education and Welfare: *See—*
Kefauver, Bernard C.; and Little, Norman, 4,030,271.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Fitzer, George E. Machine for use in monitoring fatigue life for a plurality of elastomeric specimens. 4,030,348, Cl. 73-91.000.
National Aeronautics and Space Administration: *See—*
Russell, Gary R.; Chen, Che Jen; and Harstad, Kenneth G., 4,031,389.
Navy: *See—*
Beck, Earl J., Jr., 4,031,444.
Beno, Lawrence A., 4,031,488.
Cram, Robert E.; Gill, Walter; and Loundagin, James A., 4,030,523.
Der, James J., 4,031,005.
Goldstein, David, 4,030,427.
Gowrinathan, Sankaran, 4,030,831.
Kallmann, George T.; and Waddell, Theodore P., 4,031,534.
Thomas, Virgil E., Jr.; and Quist, Donald G., 4,031,479.
Veterans Administration: *See—*
Graupe, Daniel, 4,030,141.
U.S. Philips Corporation: *See—*
Buzzi, Leo; Buzzi, Valentin; Opietnik, Walter; Liebl, Helmut; and Malobabic, Peter, 4,030,573.
Horsten, Johannes Bernardus, 4,031,523.
Khoe, Giok Djan, 4,030,810.
Khoe, Giok Djan; Kuyt, Gerard; and Franken, Adrianus Jacobus Jozef, 4,030,811.
Meijer, Roelf Jan, 4,030,404.
Schampers, Paulus Philippus Maria; and De Rijke, Pieter Adrianus, 4,030,789.
Smit, Elzo, 4,031,335.
Teuling, Dirk Johan Adriaan, 4,031,453.
van Leeuwen, Johannes Cornelis, 4,031,330.
Van Litsenburg, Joannes Wilhelmus, 4,030,899.
Van Litsenburg, Joannes Wilhelmus, 4,030,900.
Wegener, Joachim, 4,030,913.
Ziegler, Reinhard; and Seifert, Horst, 4,031,425.
United States Steel Corporation: *See—*
Pringle, William L., 4,030,576.
United Technologies Corporation: *See—*
Freiberg, Robert J.; Fradin, David W.; Chenausky, Peter P.; and Biancardi, Frank R., 4,031,484.
Kroesser, Edward James, 4,030,378.
Unitika Ltd.: *See—*
Akae, Kiyoshi; Kitada, Masaya; and Uno, Yoshiyuki, 4,030,876.
Universal Bleacher Company: *See—*
Hartman, Arlin Philip, 4,030,255.
Uno, Yoshiyuki: *See—*
Akae, Kiyoshi; Kitada, Masaya; and Uno, Yoshiyuki, 4,030,876.
UOP Inc.: *See—*
Hervert, George L., 4,031,292.
Upjohn Company, The: *See—*
Bannister, Brian, 4,031,304.
Magerlein, Barney J., 4,031,081.
Usheva, Velichka Borissova: *See—*
Arolski, Angel Tomov; Usheva, Velichka Borissova; Gruev, Peter Vassilev; Richev, Georgi Trendafilov; and Doncheva, Zvetana Semkova, 4,031,264.
USM Corporation: *See—*
Hold, Peter, 4,030,177.

Utsumi, Kazuaki: *See—*
Nakai, Tomotoshi; Utsumi, Kazuaki; and Ohno, Tomeji, 4,030,937.
Vactric Control Equipment Limited: *See—*
Garrett, David Aubrey, 4,031,441.
Vaesken, Maryvonne J.; Bultez, Alain E.; and Dalle, Jean-Paul, to Opi Cryochimie S.A. Process for treating natural polyamide fibres of asymmetric structure, such as wool, with liquid ammonia. 4,030,883, Cl. 8-115.500.
Vakanova, Elena Borisova: *See—*
Budevski, Evgueni Bogdanov; Iliev, Iliya Dimitrov; Kaisheva, Anastasiya Rostislavova; Gamburtzev, Sergei Sergeev; and Vakanova, Elena Borisova, 4,031,033.
Valenti, Peter Carl: *See—*
Stockel, Richard Frederick; and Valenti, Peter Carl, 4,031,110.
Valenya, Ivan Jurievich: *See—*
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.
Valleylab, Inc.: *See—*
Patzer, Michael D., 4,030,796.
Van Assendelft, Leendert, to Akzo N.V. Method and apparatus for making filament cables. 4,030,248, Cl. 57-9.000.
van Bokhoven, Cornelis Wilhelmus: *See—*
deJongh, Hendrik Paul; and van Bokhoven, Cornelis Wilhelmus, 4,031,074.
Van Der Wielen, Michael Principe, to Bell Telephone Laboratories, Incorporated. Miniature low profile relay. 4,031,493, Cl. 335-128.000.
Van Dine, Walter S.: *See—*
Rasor, William A.; Van Dine, Walter S.; and Whitney, Frank A., 4,030,647.
Van Eeck, Philippe F. Antipollution carburetor device for internal combustion engines. 4,030,455, Cl. 123-25.00E.
Van Geenen, Albert A.: *See—*
Otter, Marinus J.A.M. Den; Nijenhuis, Anne Te; and Van Geenen, Albert A., 4,031,040.
van Leeuwen, Johannes Cornelis, to U.S. Philips Corporation. Digital radio transmission system. 4,031,330, Cl. 179-41.00A.
Vanlerberghe, Guy; and Sebag, Henri, to Societe Anonyme dite: L'Oreal. Chitosan derivative, sequestering agents for heavy metals. 4,031,025, Cl. 252-180.000.
Vanlerberghe, Guy: *See—*
Kalopissis, Gregoire; and Vanlerberghe, Guy, 4,031,263.
Van Litsenburg, Joannes Wilhelmus, to U.S. Philips Corporation. Cooling device. 4,030,899, Cl. 62-514.00R.
Van Litsenburg, Joannes Wilhelmus, to U.S. Philips Corporation. Cooling device. 4,030,900, Cl. 62-514.00R.
van Manen, Dick T., to Voplex Corporation. Contents-conserving plunger for cartridge. 4,030,643, Cl. 222-386.000.
van Wijngaarden, Ineke: *See—*
Soudijn, Willem; van Wijngaarden, Ineke; and Janssen, Paul Adriaan Jan, 4,031,226.
Varian Associates: *See—*
Hooper, Gerald E., 4,030,829.
Varker, Kenneth James, to International Business Machines Corporation. Method for forming a multilayer printed circuit board. 4,030,190, Cl. 29-625.000.
Varta Batterie Aktiengesellschaft: *See—*
Voss, Ernst; and Rabenstein, Heinrich, 4,031,293.
Vatamanjuk, Vasily Ivanovich: *See—*
Chuiko, Alexei Alexeevich; Tertykh, Valentin Anatolievich; Sobolev, Vilyam Alexandrovich; Maschenko, Valery Mikhailovich; Pavlov, Vyacheslav Valentinovich; Chugai, Alexei Dmitrievich; Kheber, Nikolai Vasilievich; Kondratenko, Anatoly Borisovich; Vatamanjuk, Vasily Ivanovich; Khoma, Mikhail Ivanovich; Kutin, Alexandr Nikolaevich; Shaposhnikov, Jury Davydovich; and Galashina, Malvina Leontievna, 4,030,940.
Vater, Wulf: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 4,031,104.
VEB Filmfabrik Wolfen-Fotochemisches Kombinat: *See—*
Gahler, Siegfried; Junge, Karl-Wilhelm; Fischer, Gunther; Scheithauer, Steffen; and Viola, Horst, 4,030,928.
VEB Kabelwerk Oberspree (KWO): *See—*
Volz, Horst; Straubel, Reinhard; and Hager, Arnulf, 4,031,525.
Vedani, Augusto, to Sant'Andrea Novara Officine Meccaniche e Fonderie S.p.A. Device for incorporating an identification marker in a roll of textile substance. 4,030,674, Cl. 242-55.000.
Vefi A/S: *See—*
Gundersen, Marius, 4,030,272.
Velten & Pulver, Inc.: *See—*
Euverard, Maynard R.; and Heide, Henry A., 4,030,620.
Venaleck, John T., to A P Products Incorporated. Jumper connector. 4,030,799, Cl. 339-99.00R.
Verhoeven, John D.: *See—*
Gibson, Edwin D.; and Verhoeven, John D., 4,030,963.
Verkaufsgesellschaft fur Teererzeugnisse (VfT): *See—*
Gemmeke, Wilfried; Werner, Heinrich; Echterhoff, Heinz; and Raulf, Erich, 4,031,189.
Verkstadsteknik AB: *See—*
Colding, Bertil; Novak, Arne; Sandstrom, Unto; and Jakobsson, Goran, 4,031,368.
Veron, Serge: *See—*
Felix, Pierre; Gamot, Philippe; Moiroud, Guy; and Veron, Serge, 4,031,394.
Vetco Offshore Industries, Inc.: *See—*
Ahlstone, Arthur G., 4,030,544.
Vetten, Wilhelm, to Jagenberg-Werke AG. Device for the removal of empty containers from their mandrels. 4,030,616, Cl. 214-1.0BB.
Veyrassat, Louis, to Maillefer S.A. Double wire-winding machine with automatic transfer. 4,030,673, Cl. 242-25.00A.
Victor Equipment Company: *See—*
Turney, Larry R., 4,030,710.
Vidoni, John; Lingaraju, Bhartoor; and Timmins, John C., to Square D Company. Connector cap with cord grip. 4,030,800, Cl. 339-107.000.
Vinansky, George, Jr.; and Lucia, Emmanuel A., to United States of America, Army. Micro particle generation. 4,031,301, Cl. 526-328.000.
Vincent, Max. Harness for the teaching of tennis. 4,030,732, Cl. 273-29.00A.
Viola, Horst: *See—*
Gahler, Siegfried; Junge, Karl-Wilhelm; Fischer, Gunther; Scheithauer, Steffen; and Viola, Horst, 4,030,928.
Virag, Robert Anthony, to Baxter Travenol Laboratories, Inc. Twin check valve pump system having fail-safe characteristic. 4,030,495, Cl. 128-214.200.
Vitatron Medical B.V.: *See—*
Thalen, Hilbert J. Th., 4,030,508.
Vits, Helmuth: *See—*
Weller, John V. C.; Strydio, George C.; and Vits, Helmuth, 4,031,280.
Vock, Manfred: *See—*
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,031,140.
Vock, Manfred H.: *See—*
Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., 4,031,034.
Vock, Manfred Hugo: *See—*
Wilson, Richard A.; Pascale, John V.; and Vock, Manfred Hugo, 4,031,257.
Vogel, George N. Female protective device. 4,030,490, Cl. 128-130.000.
Vogel, Raimund W. Sports shoes made of plastic. 4,030,215, Cl. 36-119.000.
Vogt, Wilhelm; Auer, Eberhard; Lenz, Gunter; Merkenich, Karl; Henning, Klaus; and Kandler, Joachim, to Hoechst Aktiengesellschaft. Builders for detergent and cleaning compositions. 4,031,022, Cl. 252-89.00R.
Voigt, Gerhard: *See—*
Jacob, Friedrich; Voigt, Gerhard; and Frank, Freidhelm, 4,030,735.
Volkswagenwerk Aktiengesellschaft: *See—*
Jacob, Friedrich; Voigt, Gerhard; and Frank, Freidhelm, 4,030,735.
Jacob, Friedrich; and Morsch, Dieter, 4,030,772.
Rabenseifner, Karl, 4,030,777.
Vollerin, Bernard, to Battelle Memorial Institute. Method of and apparatus for controlling combustion. 4,030,874, Cl. 431-9.000.
Vollkommer, Norbert; and Trautvetter, Werner, to Dynamit Nobel Aktiengesellschaft. Hardenable resins based upon allyl compounds. 4,031,163, Cl. 260-837.00R.
Volz, Horst; Straubel, Reinhard; and Hager, Arnulf, to VEB Kabelwerk Oberspree (KWO). Process for recording and reproduction of information in electromagnetic form. 4,031,525, Cl. 340-174.0MS.
Von Roll AG: *See—*
Hafeli, Robert J., 4,031,192.
von Knorring, Folke: *See—*
Dahle, Orvar; von Knorring, Folke; and Siby, Sture, 4,030,346.
Voplex Corporation: *See—*
van Manen, Dick T., 4,030,643.
Voss, Ernst; and Rabenstein, Heinrich, to Varta Batterie Aktiengesellschaft. Maintenance free lead storage battery. 4,031,293, Cl. 429-60.000.
Vowinkel, Hans: *See—*
Gross, Erwin; and Vowinkel, Hans, 4,030,541.
Vrisakis, Georges, to Societe Francaise des Silicates Speciaux "Sifrance". Process for improving the stability and shaping of anhydrous sodium metasilicate, and the compositions containing same, and the resulting products. 4,031,024, Cl. 252-135.000.
Vuilleumier, Cyril: *See—*
Sauthier, Pierre A.; and Vuilleumier, Cyril, 4,030,283.
W. A. Whitney Corporation: *See—*
Swanson, James P.; and Nyquist, Stephen E., 4,030,391.
W. R. Grace & Co.: *See—*
Brax, Harri J.; Porinchak, Joseph F.; and Weinberg, Alan S., 4,031,162.
Bush, Richard Wayne, 4,031,271.
Wachi, Shigeaki: *See—*
Suzuki, Tadao; Yoshida, Tadao; and Wachi, Shigeaki, 4,031,454.
Wada, Minoru: *See—*
Fujii, Setsuro; Kajita, Yasumichi; Hiraku, Seizi; Kira, Heizo; Aishita, Hideki; Muryobayashi, Keiko; Terashima, Hiroshi; Akimoto, Akira; Taniguchi, Ken; and Wada, Minoru, 4,030,977.

Waddell, Theodore P.: *See*—
Kallmann, George T.; and Waddell, Theodore P., 4,031,534.
Wafer, John A., to Westinghouse Electric Corporation. Triple break current limiter. 4,031,492, Cl. 335-16.000.
Wagner, Alfred; and Kidratschky, Hermann. Device for continuous lubrication of an extrusion die. 4,030,328, Cl. 72-45.000.
Wagner, Alfred; and Kidratschky, Hermann, to Swiss Aluminium Ltd. Process for the manufacture of composite sections and a device for carrying this out. 4,030,334, Cl. 72-258.000.
Wagner, John Bradley. Nose piece for screwguns. 4,030,383, Cl. 81-54.000.
Wahle, Gunter, to Hauni-Werke Korber & Co., KG. Control system for cigarette producing and processing machines or the like. 4,030,511, Cl. 131-21.00R.
Wahlig, Helmut: *See*—
Gottschlich, Rudolf; Rogalski, Werner; Bergmann, Rolf; Steinigeweg, Rosmarie; and Wahlig, Helmut, 4,031,230.
Wake, Malcolm: *See*—
Dudley, Philip; Bower, Lewis Robert; and Wake, Malcolm, 4,030,308.
Wakimoto, Harumi: *See*—
Shimada, Shunji; and Wakimoto, Harumi, 4,031,409.
Walch, Leo M., Jr.: *See*—
Moll, Eberhard; and Walch, Leo M., Jr., 4,031,361.
Walker, Alexander D. R. Computer terminal. 4,030,587, Cl. 197-1.00R.
Walker, Leonard B. Device for accurately sanding objects such as wooden objects and the like. 4,030,250, Cl. 51-128.000.
Walker, Osman J.: *See*—
Goel, Krishan N.; and Walker, Osman J., 4,030,968.
Walker, Philip Leroy, Jr.: *See*—
Schmitt, Joseph Lawrence, Jr.; Walker, Philip Leroy, Jr.; and Castellion, George Augustus, 4,031,137.
Wall Industries, Inc.: *See*—
Hood, Henry Alexander, 4,030,401.
Wallace, Harry L.; and Templeton, William B., to Burroughs Corporation. Document transport apparatus. 4,030,728, Cl. 271-277.000.
Walley, Robert F.: *See*—
Muzyka, Donald R.; and Walley, Robert F., 4,030,946.
Wallin, Jan-Olof, to Granges Essem Aktiebolag. Locking mechanism for vehicle safety belts. 4,030,682, Cl. 242-107.40B.
Wallin, Mark; and Shantzer, Aaron, deceased (by Shantzer, Helen, executrix), to Shantzer-Wallin Corporation. Heat pumps with solar heat source. 4,030,312, Cl. 62-2.000.
Walters, William T.; and Parlette, Marvin D., Jr., to Conceptual Products, Inc. Respiratory mouthpiece. 4,030,493, Cl. 128-147.000.
Wander, Raoul; and Angue, Robert. Apparatus for sterilization. 4,030,406, Cl. 99-461.000.
Wandler, Richard A.: *See*—
Lennon, David C.; and Wandler, Richard A., 4,030,802.
Ward, Dean L.: *See*—
Robertson, Joseph D.; and Ward, Dean L., 4,030,205.
Ward, George C., to Southwire Company. Thin gauge casting wheel band. 4,030,537, Cl. 164-278.000.
Ward, James S., to Ward, James S. Highway guard rail bumper guard. 4,030,706, Cl. 256-1.000.
Ware, William P.; and Wheeler, Robert D., to Thomas Industries of Tennessee, Inc. Apparatus and method for pneumatically rodding multi-passage cable housing conduits. 4,030,702, Cl. 254-134.400.
Warner, Glenfield. Method and apparatus for continuously monitoring systolic blood pressure. 4,030,485, Cl. 128-2.05A.
Warner Lewis Jr. Industrie- Filter GmbH: *See*—
Runge, Hans-Jurgen, 4,030,368.
Warthen, William P., to Milliken Research Corporation. Synthetic yarn device. 4,030,743, Cl. 289-18.000.
Wasson, George E.: *See*—
Gorin, Everett; Jasulaitis, William A.; Theodore, Frank W.; and Wasson, George E., 4,030,982.
Watanabe, Makoto: *See*—
Sonobe, Shigeru; Watanabe, Makoto; Kato, Iwao; and Sato, Tomoyoshi, 4,030,828.
Watanabe, Misuzu: *See*—
Hayashi, Masahiro; Haba, Masanori; Watanabe, Misuzu; and Hirano, Shinji, 4,031,498.
Watanabe, Shutoku: *See*—
Saiki, Yukimi; Ogino, Masanori; and Watanabe, Shutoku, 4,031,547.
Waters, Ethel M., administratrix: *See*—
Keifert, Hibbard G.; and Waters, Frank J., deceased, 4,030,848.
Keifert, Hibbard G.; and Waters, Frank J., deceased, 4,030,849.
Waters, Frank J., deceased: *See*—
Keifert, Hibbard G.; and Waters, Frank J., deceased, 4,030,848.
Keifert, Hibbard G.; and Waters, Frank J., deceased, 4,030,849.
Watkins, Michael L. Aerial toy and launching stick apparatus. 4,030,472, Cl. 124-5.000.
Watts, Glen Armon. Plow trip. 4,030,552, Cl. 172-663.000.
Wavin B.V.: *See*—
Jan Leloux, Arnoldus Willem, 4,030,956.
Webb, Nolan J., to McNeil Corporation. Solid fuel heater with blowback prevention means. 4,030,479, Cl. 126-287.000.
Weber, Andreas: *See*—
Frey, Jurgen; Weber, Andreas; and Triffterer, Adolf, 4,030,463.
Weber, Heinz, to Telesco Brophey Limited. Telescopic umbrella. 4,030,515, Cl. 135-25.00R.
Weber, Wayne W., II: *See*—
Leone, Ronald E.; Weber, Wayne W., II; and Wrathall, Donald P., 4,030,925.
Leone, Ronald E.; Weber, Wayne W., II; and Wrathall, Donald P., 4,031,127.
Wegener, Joachim, to U.S. Philips Corporation. Method of stabilizing pyrophorous iron powder. 4,030,913, Cl. 75-.5OR.
Wei, Chung H., to Stauffer Chemical Company. Process for forming a polyvinyl chloride extender resin by incorporating in the suspension polymerization medium a prehomogenized solution of a polyallyl compound and a low molecular polymer of propylene. 4,031,299, Cl. 526-193.000.
Weinberg, Alan S.: *See*—
Brax, Harri J.; Porinchak, Joseph F.; and Weinberg, Alan S., 4,031,162.
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., to Merck & Co., Inc. 3-Sulfonate ester of 2,3-dihydroxypropylamine. 4,031,125, Cl. 260-456.00A.
Weiss, William Robert; Cooksey, James Judson; Stables, Wilbur Leon; and Newell, Harry Lee, Jr., to Allied Chemical Corporation. Interfloor tube aspirator muffler. 4,030,651, Cl. 226-97.000.
Weller, John V. C.; Strydio, George C.; and Vits, Helmuth, to Bigelow-Sanford, Inc. Method and apparatus for coloring a pile fabric, and a pile fabric produced thereby. 4,031,280, Cl. 428-88.000.
Weller, Kenneth P.: *See*—
Lee, Don H.; Weller, Kenneth P.; and Thrower, William F., 4,030,943.
Welstead, William John, Jr., to A. H. Robins Company, Incorporated. Alkenyl and alkanylamines for treating depression. 4,031,245, Cl. 424-330.000.
Wemyss, William Alexander, to Litre Meter Limited. Metering of fluid flows. 4,030,357, Cl. 73-202.000.
Werner, Heinrich: *See*—
Gemmeke, Wilfried; Werner, Heinrich; Echterhoff, Heinz; and Raulf, Erich, 4,031,189.
WERSI-electronic GmbH & Co. Kommanditgesellschaft fur elektronische Gerate und elektronische Bauelemente: *See*—
Dittmar, Wilfried, 4,030,398.
Wesner, Charles R., to Sperry Rand Corporation. Apparatus for coupling a digital data generator to a digital data readout device with electrical isolation therebetween. 4,031,417, Cl. 307-311.000.
West, Robert E., to Cascade Industries, Incorporated. Floating boom. 4,030,304, Cl. 61-1.00F.
Westall, Edward B.; and Messing, Alan W., to Nutrilite Products, Inc. Salts of dihydrochalcone derivatives and their use as sweeteners. 4,031,260, Cl. 426-548.000.
Westell, William E., to United States of America, Army. Apodization filter. 4,030,817, Cl. 350-314.000.
Western Electric Company, Inc.: *See*—
Hornig, Carl F.; Kroupa, Kenneth M.; and Simpson, Earle E., 4,030,966.
Western Gear Corporation: *See*—
Shutt, Donald P., 4,030,353.
Western Geophysical Company of America: *See*—
Mioduski, George T., 4,031,504.
Siems, Lee E., 4,031,506.
Westinghouse Electric Corporation: *See*—
Anderson, Arthur E., 4,031,542.
Berkovitz, Harry, 4,030,569.
Bleeker, Raymond A., 4,030,788.
Britton, James S., 4,031,511.
Caputo, William R., 4,030,570.
Davis, Guy E., 4,031,372.
Loch, Emil P., 4,030,419.
Martz, Lyle F.; and Plotnick, Richard J., 4,031,404.
Mazanek, Alfonso J., 4,031,311.
McShane, James L., 4,030,175.
Reed, Terry J., 4,031,407.
Wafer, John A., 4,031,492.
Westvaco Corporation: *See*—
Lipovac, Stanislava N., 4,030,417.
Wheeler, Philip T., to Hardy Company, The. Tag applicating device. 4,030,182, Cl. 29-816.000.
Wheeler, Robert D.: *See*—
Ware, William P.; and Wheeler, Robert D., 4,030,702.
Whetten, Nathan Rey; and Houston, John M., to General Electric Company. X-ray detector. 4,031,396, Cl. 250-385.000.
Whirlpool Corporation: *See*—
Cobb, John Farley, 4,030,871.
White, Herbert O. Marine propulsion device. 4,030,442, Cl. 115-14.000.
White, John; and Abbots, David. Combination writing instrument and information storage apparatus. 4,030,842, Cl. 401-195.000.
White, Peter Charles; Benson, John Terry; and Leoncavallo, Richard Anthony, to Mattel, Inc. Multiple face doll. 4,030,239, Cl. 46-135.00R.
Whitney, Frank A.: *See*—
Rasor, William A.; Van Dine, Walter S.; and Whitney, Frank A., 4,030,647.
Whitney, James M.: *See*—
Singleton, Lewis, Jr.; and Whitney, James M., 4,031,467.
Wick, Richard; Bestenreiner, Friedrich; Deml, Reinhold; and Helmberger, Josef, to AGFA-Gevaert, A.G. Film scanner. 4,031,550, Cl. 358-216.000.
Wickersham, Floyd David. Boat cleaning machine. 4,030,440, Cl. 114-222.000.

Wilcox, David E., to Flanders Filters, Inc. Air flow control apparatus. 4,030,518, Cl. 137-246.000.

Wilder, Paul R.: *See—*
McMath, Jack Alan; Wilder, Paul R.; and Alderson, Larry Lee, 4,030,524.

Willasch, Dieter: *See—*
Muller, Karl-Heinz; Rindfleisch, Volker; Rauch, Moriz V.; and Willasch, Dieter, 4,031,390.

Willersinn, Carl-Heinz: *See—*
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; Lebert, Ulrich; and Thiessen, Fritz, 4,031,135.

Willersinn, Herbert: *See—*
Bronstert, Klaus; Fahrbach, Gerhard; Krahe, Eduard; Ladenberger, Volker; Kastning, Ernst-Guenther; Mittnacht, Hans; Willersinn, Herbert; and Trieschmann, Hans-Georg, 4,031,166.

Willetts, Elwood H. Tandem axle vehicle suspension system. 4,030,738, Cl. 280-681.000.

William Prym-Werke KG: *See—*
Pickert, Hansjurgen; Sesselmann, Hans Dieter; and Timmers, Leonardes August, 4,030,430.

Williams, G. Norman; and Schultz, Thomas W., to GTE Sylvania Incorporated. Process for fabricating lenses for manufacturing cathode ray tube screen structures. 4,030,790, Cl. 316-23.000.

Williams, Haydn Windsor Richard; and Rooney, Clarence Stanley, to Merck Sharp & Dohme (I.A.) Corporation. 1,8-Naphthyridine compounds. 4,031,103, Cl. 260-295.00N.

Williams, Jeffrey L.: *See—*
Archer, John L.; Tocci, Leonard R.; and Williams, Jeffrey L., 4,031,526.

Williams, Joseph James, to Hoffmann-La Roche Inc. Force measurement and analysis particularly relating to rotary tablet presses. 4,030,868, Cl. 425-149.000.

Willis, Melvin M. Binder for alumina containing refractories. 4,030,936, Cl. 106-65.000.

Willums, Jan-Olaf, to Nor-Am Resources Technology Inc. Method of and apparatus for underwater hydraulic conveying, as for ocean mining and the like, and continued transport of material in controlled floating containers. 4,030,216, Cl. 37-58.000.

Wilmot, Richard D., to Hughes Aircraft Company. Multiple moment video detector. 4,031,364, Cl. 235-151.300.

Wilson, Leland Earl, to Atlantic Richfield Company. Method of moving a floating body into a predetermined float path. 4,030,305, Cl. 61-1.00R.

Wilson, Richard A.; Pascale, John V.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Use in foodstuff flavoring compositions of five or six membered heterocylic oxathio compounds. 4,031,257, Cl. 426-535.000.

Wilson, Richard Arnold; Katz, Ira; Vock, Manfred H.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Altering perfume green notes using trithioacetone. 4,031,034, Cl. 252-522.000.

Wimber, Hans; Rohde, Wilhelm; and Reyhing, Jorg, to Linde Aktiengesellschaft. Regeneration of adsorbents. 4,030,896, Cl. 55-33.000.

Wine, Charles Martin: *See—*
Rast, Robert Morgan; Wine, Charles Martin; and Henderson, John Goodchilde Norie, 4,031,549.

Winkelmann, Erhardt; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. 1-Alkyl-2-(phenoxymethyl)-5-nitro-imidazoles and process for their manufacture. 4,031,232, Cl. 424-273.000.

Wisconsin Alumni Research Foundation: *See—*
Sih, Charles J., 4,031,129.

Wittle, Eugene Leroy; and Nicolaides, Ernest D., to Parke, Davis & Company. Tetrapeptides. 4,031,071, Cl. 260-112.5LH.

Wix Corporation: *See—*
Howard, Fred, 4,030,608.

Wojdyla, Gary A., to NCR Corporation. Spacing and connecting a plurality of print heads. 4,030,590, Cl. 197-1.00R.

Wojdyla, Gary A.; and Hanna, Kenneth W., to NCR Corporation. Record media rewind mechanism. 4,030,677, Cl. 242-65.000.

Wolf, Morris A. Clothing display form. 4,030,645, Cl. 223-68.000.

Wolfe, Gerald W., to InterMed, Inc. Occluder for prosthetic heart valve assembly. 4,030,142, Cl. 3-1.500.

Wolfel, Kurt: *See—*
Buttner, Karl; Boll, Jurgen; and Wolfel, Kurt, 4,030,174.

Wolff, Erich: *See—*
Idel, Karsten-Josef; Saleck, Wilhelm; Wolff, Erich; and Freitag, Dieter, 4,030,929.

Woods, Gilbert Frederick; Logan, Robert Thomas; McGarry, George; and Roy, Robert Gibson, to Akzona Incorporated. Alkylated pregnanes and process for obtaining same. 4,031,075, Cl. 260-239.55D.

Woodstream Corporation: *See—*
Souza, Anthony J., 4,030,152.
Souza, Anthony J., 4,030,230.

Woodward, Oakley McDonald, to RCA Corporation. Broadband turnstile antenna. 4,031,539, Cl. 343-797.000.

Wrathall, Donald P.: *See—*
Leone, Ronald E.; Weber, Wayne W., II; and Wrathall, Donald P., 4,030,925.
Leone, Ronald E.; Weber, Wayne W., II; and Wrathall, Donald P., 4,031,127.

Wunnenberg, Klaus; and Dubendorff, Joachim, to Mannesmann Aktiengesellschaft. Method and apparatus for monitoring and obviating deformations of continuous castings. 4,030,531, Cl. 164-4.000.

Wunsche, Anton E. Cockroach trap. 4,030,233, Cl. 43-121.000.

Wuthrich, Paul; and Mascia, Frank P., to Timex Corporation. Dual function pusher and rotate switch for solid state digital watches having detent spring. 4,031,341, Cl. 200-52.00R.

Xerox Corporation: *See—*
Chu, Joseph Y. C.; and Gunther, W. H. H., 4,030,991.
Chu, Joseph Y. C.; and Gunther, W. H. H., 4,030,992.
Chu, Joseph Y. C.; and Gunther, W. H. H., 4,030,993.
Griffiths, Clifford H.; and Keezer, Richard C., 4,031,109.
Schank, Richard L., 4,030,416.
Smith, Richard S., 4,030,824.

Xynetics, Inc.: *See—*
Roch, Jacques L., 4,030,527.

Yagupolsky, Lev Moiseevich: *See—*
Ponomarev, Alexei Ivanovich; Sokolov, Sergei Vasilievich; Larionova, Julia Alexeevna; Klebansky, Alexandr Leibovich; Berenblit, Vsevolod Volfovich; Dolnakov, Jury Pavlovich; Yagupolsky, Lev Moiseevich; Malovik, Vladlen Vasilievich; Lozinsky, Miron Onufrievich; Belous, Viktor Mikhailovich; Gruz, Boris Efimovich; Alexeeva, Ljubov Antonovna; Ankudinov, Anatoly Kirillovich; and Ryazanova, Rufina Mikhailovna, 4,031,119.

Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich. Impact impulse measuring device. 4,030,339, Cl. 73-12.000.

Yamaguchi, Kineo; Kawakami, Katsuhiko; and Nakamoto, Yukimasa, to Nippon Mining Co., Ltd. Method for treating catalyst used for catalytic reactions of hydrocarbons at the time of catalyst removal. 4,031,031, Cl. 252-414.000.

Yamaguchi, Shunzo; Ozaki, Tadashi; and Konomi, Toshiaki, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel-air mixture heating device for use with internal combustion engine. 4,030,464, Cl. 123-122.0AC.

Yamamoto, Hiroshi; and Oka, Masaaki, to Toa Medical Electronics Co., Ltd. Automatic blood analyzer. 4,030,888, Cl. 23-253.00R.

Yamamoto, Kenichi; Kirose, Yutaka; and Maeda, Tooru, to Toyo Kogyo Co., Ltd. Rotary piston engines. 4,030,454, Cl. 123-8.450.

Yamashiro, Osamu: *See—*
Shimada, Shunji; Hatsukano, Yoshikazu; and Yamashiro, Osamu, 4,031,456.

Yamatake-Honeywell Company Limited: *See—*
Togo, Masaaki; Shima, Masao; and Mochizuki, Kiyoshi, 4,031,447.

Yanagishima, Takayuki; and Inoue, Naohiko, to Nissan Motor Co., Ltd. Electronic alerting system for a vehicle driver. 4,031,527, Cl. 340-279.000.

Yatsenko, Sergei Vasilievich: *See—*
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.

Yazaki, Susumu: *See—*
Nagata, Yasunori; Itoh, Hirotaka; Yazaki, Susumu; Hamamura, Takayuki; and Yoshiya, Shigeo, 4,030,884.

Yeakley, Lester M.: *See—*
Norris, Elwood B.; and Yeakley, Lester M., 4,030,347.

Yealy, Carl F., to Penland Container, Inc. All plastic reclosable container closure. 4,030,630, Cl. 220-258.000.

Yeda Research and Development Co., Ltd.: *See—*
Haviv, Fortuna; Patchornik, Abraham; and Altman, Janina, 4,031,083.

Yeo, Herbert G.: *See—*
Hanlon, Richard J.; Damon, Neil F.; and Yeo, Herbert G., 4,030,793.

Yeomans, David L. Article support assembly. 4,030,425, Cl. 108-111.000.

Yeomans, Frederick G., to Draftex Development AG. Channel-shaped sealing and finishing strips. 4,030,245, Cl. 49-490.000.

Yokota, Hideo: *See—*
Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 4,031,383.

York, Alvin, to Jefferson, Eva Imogene; and Koehler, Peggy Joe, part interest to each. Hammer tool for carpet strip. 4,030,654, Cl. 227-110.000.

Yoshida, Tadao, to Sony Corporation. Transistor amplifier. 4,031,481, Cl. 330-35.000.

Yoshida, Tadao: *See—*
Suzuki, Tadao; Yoshida, Tadao; and Wachi, Shigeaki, 4,031,454.

Yoshiya, Shigeo: *See—*
Nagata, Yasunori; Itoh, Hirotaka; Yazaki, Susumu; Hamamura, Takayuki; and Yoshiya, Shigeo, 4,030,884.

Yotsukura, Teruo: *See—*
Takenaga, Hisayoshi; and Yotsukura, Teruo, 4,030,445.

Young, Alastair John, to Automotive Products Limited. Vehicle braking system. 4,030,771, Cl. 280-88.000.

Young, Robert D. Mechanisms for feeding documents from a stack thereof. 4,030,413, Cl. 101-232.000.

Yu, Herbert Chia-Chen: *See—*
Peng, Luke Shih-Cheng; and Yu, Herbert Chia-Chen, 4,030,769.

Yuminaka, Takeo: *See—*
Kaneko, Takashi; Yuminaka, Takeo; Iwasaka, Tatsuo; and Kinoshita, Hiroshi, 4,030,571.
Kaneko, Takashi; Iwasaka, Tatsuo; and Yuminaka, Takeo, 4,030,572.
Zabrocki, Karl: *See—*
Dhein, Rolf; Zabrocki, Karl; Beer, Wolfgang; and Kuchenmeister, Rolf, 4,031,047.
Zahnradfabrik Friedrichshafen AG: *See—*
Elser, Dieter, 4,030,403.
Zakirov, Robert Sharafutdinovich: *See—*
Ponomarenko, Nikolai Borisovich; Kononenko, Vadim Grigorievich; Stelmakh, Viktor Alexeevich; Kotelnikov, Vladimir Ivanovich; Valenya, Ivan Jurievich; Sarancha, Vladimir Nikolaevich; Petrenko, Anatoly Avramovich; Bozhko, Valery Pavlovich; Yatsenko, Sergei Vasilievich; Komnatny, Igor Pavlovich; Akhnazariants, Levon Khachaturovich; Strizhenko, Vitaly Evgenievich; Kolokolov, Boris Alexeevich; Maznichenko, Stanislav Anisimovich; Bozhko, Viktor Vasilievich; Bondarenko, Oleg Alexandrovich; and Zakirov, Robert Sharafutdinovich, 4,030,389.
Zdor, Gennady Nikolaevich: *See—*
Chachin, Viktor Nikolaevich; Zhuravsky, Alexandr Julyanovich; Zdor, Gennady Nikolaevich; Shaduya, Vladimir Leontievich; and Golovkina, Elena Yakovlevna, 4,030,329.
Zdrazil, Jiri: *See—*
Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, 4,030,944.
Zeck, Phillip: *See—*
Merrihew, Larry D.; and Zeck, Phillip, 4,030,733.
Zeigler, Edward H., to United States of America, Army. Process for preparing nitrocellulose for use in small arms. 4,031,172, Cl. 264-3.00B.
Zeile, Karl: *See—*
Koppe, Herbert; Zeile, Karl; Kummer, Werner; Stahle, Helmut; and Danneberg, Peter, 4,031,244.
Zenger, Willi: *See—*
Stait, Donald Peter; and Zenger, Willi, 4,030,496.
Zerlaut, Gene A.; and Heiskell, Robert F., to Desert Sunshine Exposure Tests, Inc. Solar tracking device. 4,031,385, Cl. 250-203.00R.
Zhuravsky, Alexandr Julyanovich: *See—*
Chachin, Viktor Nikolaevich; Zhuravsky, Alexandr Julyanovich; Zdor, Gennady Nikolaevich; Shaduya, Vladimir Leontievich; and Golovkina, Elena Yakovlevna, 4,030,329.
Ziebell, Donald O.; and Longly, James M., to Reach Electronics, Inc. Receiver mount. 4,031,468, Cl. 325-312.000.
Ziegler, Reinhard; and Seifert, Horst, to U.S. Philips Corporation. Dispenser cathode for a grid-controlled electron tube and method of manufacturing same. 4,031,425, Cl. 313-346.00R.
Zimmer, Peter. Dyestuff applicator for screen printer. 4,030,410, Cl. 101-120.000.
Zimmer, Peter. Rotary-screen printing machine. 4,030,411, Cl. 101-126.000.
Zinn, Frank R., to Bingham and Taylor. Valve cover for buried valve, permitting access thereto. 4,030,519, Cl. 137-364.000.
Zinna, Edward F. Speaker system of cubic configuration. 4,030,563, Cl. 181-147.000.
Zioni, Dov; and Halperin, Levi Y., to Shaare Zedek Hospital. Switching device. 4,031,435, Cl. 361-186.000.
ZLEHIT pri BAN: *See—*
Budevski, Evgueni Bogdanov; Iliev, Iliya Dimitrov; Kaisheva, Anastasiya Rostislavova; Gamburtzev, Sergei Sergeev; and Vakanova, Elena Borisova, 4,031,033.
Zniitmash: *See—*
Kochemidov, Atanas Dimitrov; Makedonski, Boris Georgiev; Dumanov, Ivan Minkov; Payakov, Stefan Georgiev; Galabov, Peter Konstantinov; and Atanassov, Haralampi Aangelov, 4,030,249.
Zuber, Walter H., Jr.: *See—*
Zuber, Walter Henry, 4,030,979.
Zuber, Walter Henry, to Zuber, Walter H., Jr. Method of detecting hydrogen-producing bacteria. 4,030,979, Cl. 195-103.50M.
Zucconi, Bruno: *See—*
Rutschow, Joseph Fredrick; and Zucconi, Bruno, 4,030,953.
Zuern, Ludwig: *See—*
Tatzel, Hermann; Koegel, Wolfram; Beck, Gilbert; Zuern, Ludwig; and Caesar, Arndt Christian, 4,031,179.
Zurn Industries, Inc.: *See—*
Brugger, Richard D.; and Barna, Joseph A., 4,031,362.
53: *See—*
Jesty, Thomas William; Anderson, John; and 53, 4,030,407.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF JUNE, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Seating Company: *See*—
Barecki, Chester J., Re. 29,271.

B. F. Goodrich Company, The: *See*—
Kuts, Mathew, Re. 29,268.

Barecki, Chester J., to American Seating Company. Cantilevered seat for motorcoach vehicles or the like. Re. 29,271, Cl. 297-451.000.

Berman, Herbert; and Tenen, Stanley N. Motor control system. Re. 29,275, Cl. 318-227.000.

Braden, Denver, to Illinois Tool Works Inc. Automatic lead straightening of axial leaded components. Re. 29,269, Cl. 140-147.000.

Canon Kabushiki Kaisha: *See*—
Mitani, Taizo; and Shirashaki, Takayuki, Re. 29,276.

Collette, Richard L.; Vojir, Frank S.; and Watts, Roger E., to Guardian Electric Manufacturing Company. Mechanical counter. Re. 29,274, Cl. 235-91.00R.

Coltron Industries, Inc.: *See*—
Leitner, Frank Wilhite; and Griffin, William Thomas, Re. 29,267.

Griffin, William Thomas: *See*—
Leitner, Frank Wilhite; and Griffin, William Thomas, Re. 29,267.

Guardian Electric Manufacturing Company: *See*—
Collette, Richard L.; Vojir, Frank S.; and Watts, Roger E., Re. 29,274.

Hintz, Harold L.; and Webb, Joseph T., to Westvaco Corporation. Water resistant corrugated paperboard. Re. 29,272, Cl. 156-208.000.

Illinois Tool Works Inc.: *See*—
Braden, Denver, Re. 29,269.

Kuts, Mathew, to B. F. Goodrich Company, The. Fabric cutting. Re. 29,268, Cl. 83-488.000.

Leitner, Frank Wilhite; and Griffin, William Thomas, to Coltron Industries, Inc. Apparatus for straightening fabric. Re. 29,267, Cl. 26-51.500.

Mitani, Taizo; and Shirashaki, Takayuki, to Canon Kabushiki Kaisha. Lens attachment for flash-light photographing. Re. 29,276, Cl. 354-32.000.

Nelson, Ardell H. Floating cover for a tank. Re. 29,270, Cl. 220-220.000.

Reiffin, Martin G. Direct-current-coupled transistor power amplifiers. Re. 29,273, Cl. 179-1.00A.

Shirashaki, Takayuki: *See*—
Mitani, Taizo; and Shirashaki, Takayuki, Re. 29,276.

Tenen, Stanley N.: *See*—
Berman, Herbert; and Tenen, Stanley N., Re. 29,275.

Vojir, Frank S.: *See*—
Collette, Richard L.; Vojir, Frank S.; and Watts, Roger E., Re. 29,274.

Watts, Roger E.: *See*—
Collette, Richard L.; Vojir, Frank S.; and Watts, Roger E., Re. 29,274.

Webb, Joseph T.: *See*—
Hintz, Harold L.; and Webb, Joseph T., Re. 29,272.

Westvaco Corporation: *See*—
Hintz, Harold L.; and Webb, Joseph T., Re. 29,272.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
McGredy, Samuel, IV, 4,063.

McGredy, Samuel, IV, to Armstrong Nurseries, Inc. Rose plant. 4,063, 6-21-77, Cl. 15.000.

Minami, William Y. Peach tree. 4,064, 6-21-77, Cl. 43.000.

Pittman, Roy Nyal. Kalanchoe plant. 4,062, 6-21-77, Cl. 68.000.

LIST OF DESIGN PATENTEES

Aktiebolaget Gustavsbergs Fabriker: *See*—
Juhlin, Sven-Eric, 244,738.

AO:s Metall & Mek. Verkstad AB: *See*—
Ohlson, Carl-Eric, 244,805.

Bard, Donald I. Portable adjustable stand for a needlework frame. 244,754, 6-21-77, Cl. D15-66.000.

Bard, Donald I. Portable adjustable stand for supporting an embroidery hoop. 244,755, 6-21-77, Cl. D15-66.000.

Beautiline Systems Limited: *See*—
Bobrovniczky, Bertalan Tamas, 244,777.

Berkline Corporation, The: *See*—
Long, Stapleton, 244,730.

Black and Decker Manufacturing Company, The: *See*—
Bunyea, Roderick Francis, 244,744.

Bobrovniczky, Bertalan Tamas, to Beautiline Systems Limited. Tubular post. 244,777, 6-21-77, Cl. D25-75.000.

Borri, Ambrogio. Shoe. 244,727, 6-21-77, Cl. D2-287.000.

Bott, John A. License plate holder. 244,771, 6-21-77, Cl. D12-193.000.

Bridgestone Tire Company Limited: *See*—
Kojima, Hiroshi; Hayakawa, Toshio; and Yoshihara, Masafumi, 244,770.

Buhk, Randall P., to Steelcase, Inc. Swivel chair. 244,729, 6-21-77, Cl. D6-31.000.

Bunyea, Roderick Francis, to Black and Decker Manufacturing Company, The. Detachable grass shear head for cordless tool. 244,744, 6-21-77, Cl. D8-8.000.

Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, to WCB Containers Limited. Pod module for use as play equipment. 244,788, 6-21-77, Cl. D34-5.00H.

Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, to WCB Containers Limited. Slab module for use as play equipment. 244,789, 6-21-77, Cl. D34-5.00H.

Canterbury, Robert W., to Holly Enterprises. Bracket for mounting accessories over the transmission hump of a vehicle. 244,748, 6-21-77, Cl. D8-380.000.

Carlson, Phillip Howard; and Erickson, Lawrence E., to International Telephone and Telegraph Corporation. Field hockey stick. 244,790, 6-21-77, Cl. D34-5.0BC.

Cohen, Martin B., to Latin Percussion, Inc. Musical whistle. 244,787, 6-21-77, Cl. D34-15.00C.

Concept, Inc.: *See*—
Staub, David E., 244,796.

Contact Systems, Inc.: *See*—
Latanzi, Lewis A., 244,778.

Control Products Inc.: *See*—
Dacal, Perfecto, 244,794.

Curtis, Frank S. Rat trap. 244,773, 6-21-77, Cl. D22-18.000.

D. Swarovski & Co.: *See*—
Grubauer, Emil, 244,764.

Dacal, Perfecto, to Control Products Inc. Explosion proof fluorescent lamp for mines or the like. 244,794, 6-21-77, Cl. D48-20.00E.

Daenen, Robert H. C. M., to Dart Industries Inc. Covered compartmented bowl. 244,741, 6-21-77, Cl. D7-17.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Covered serving bowl or the like. 244,742, 6-21-77, Cl. D7-17.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M., 244,741.
Daenen, Robert H. C. M., 244,742.

Davis, Lee W.: *See—*
Roberts, Leo L.; Davis, Lee W.; and Hollingsworth, Jim S., 244,750.

DeLand, George R., to Odetics, Inc. Video program selection and display system. 244,801, 6-21-77, Cl. D14-82.000.

Ditto, Donald R. Butterfly ornament. 244,767, 6-21-77, Cl. D11-137.000.

Dose, John H. Anti-water splash shield for bathtubs. 244,774, 6-21-77, Cl. D23-69.000.

Dryden, Littleton P., to Premier Manufacturing Co. Bird feeder. 244,786, 6-21-77, Cl. D30-15.000.

Durand, Philippe J. Wine glass or similar article. 244,739, 6-21-77, Cl. D7-13.000.

Durand, Philippe J. Tumbler or similar article. 244,740, 6-21-77, Cl. D7-14.000.

Elsdale, Timothy Sefton: *See—*
Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, 244,788.
Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, 244,789.

Erickson, Lawrence E.: *See—*
Carlson, Phillip Howard; and Erickson, Lawrence E., 244,790.

Fleck, Fred. Drum. 244,798, 6-21-77, Cl. D56-1.00E.

Fratelli Saporiti: *See—*
Introini, Vittorio, 244,732.

Friedr. Dick G.m.b.H.: *See—*
Solf, Johannes Josef, 244,747.

Gelinas, Paul B. Driving iron head. 244,792, 6-21-77, Cl. D34-5.0GH.

General Bathroom Products Corporation: *See—*
Palka, James J., 244,736.

General Electric Company: *See—*
Kolwaite, John S., 244,799.

Goto, Kenjiro. Cigarette lighter. 244,782, 6-21-77, Cl. D27-36.000.

Goulet, Donald L.: *See—*
Ruud, Alan J., 244,793.

Granzow, Clarence E. Grain mill. 244,756, 6-21-77, Cl. D15-98.000.

Graziano, Anthony J.: *See—*
Wasmer, Roger K. F.; McCord, David W.; and Graziano, Anthony J., 244,762.

Grenon, Krystin L. Jewelry pin for display of photographic negative contact prints. 244,765, 6-21-77, Cl. D11-40.000.

Grubauer, Emil, to D. Swarovski & Co. Road-traffic stud. 244,764, 6-21-77, Cl. D10-113.000.

Hayakawa, Toshio: *See—*
Kojima, Hiroshi; Hayakawa, Toshio; and Yoshihara, Masafumi, 244,770.

Henry, Franklin H. Wardrobe systemizer device. 244,737, 6-21-77, Cl. D6-257.000.

Hickey, Larry G.: *See—*
James, Norman J.; Hickey, Larry G.; and Powers, Fred, 244,731.

Hodges, Dale R. Ribbon container. 244,749, 6-21-77, Cl. D9-238.000.

Hollingsworth, Jim S.: *See—*
Roberts, Leo L.; Davis, Lee W.; and Hollingsworth, Jim S., 244,750.

Holly Enterprises: *See—*
Canterbury, Robert W., 244,748.

International Telephone and Telegraph Corporation: *See—*
Carlson, Phillip Howard; and Erickson, Lawrence E., 244,790.

Introini, Vittorio, to Fratelli Saporiti. Chair. 244,732, 6-21-77, Cl. D6-76.000.

James, Norman J.; Hickey, Larry G.; and Powers, Fred, to Rohr Industries, Inc. Bus seat. 244,731, 6-21-77, Cl. D6-48.000.

Juhlin, Sven-Eric, to Aktiebolaget Gustavsbergs Fabriker. Cup and saucer combination. 244,738, 6-21-77, Cl. D7-3.000.

Kael, Diane I. Dual handled hair brush. 244,728, 6-21-77, Cl. D4-31.000.

Katz, Marcella M. Pocket-top shoe. 244,726, 6-21-77, Cl. D2-265.000.

Kennedy, Robert J., Jr.; and Smith, Kendall S., II, to Lincoln Manufacturing Company, Inc. Panel for use with a modular counter unit. 244,735, 6-21-77, Cl. D6-193.000.

Kido, Katsutoshi; and Yamamoto, Susumu, to Matsushita Electric Industrial Co., Ltd. Combined tape recorder and radio receiver. 244,800, 6-21-77, Cl. D14-5.000.

Kies, Jared R., to Owens-Corning Fiberglas Corporation. Embossed plastic sheet material. 244,802, 6-21-77, Cl. D87-3.00G.

Kies, Jared R., to Owens-Corning Fiberglas Corporation. Embossed plastic sheet material. 244,803, 6-21-77, Cl. D87-3.00G.

Kies, Jared R., to Owens-Corning Fiberglas Corporation. Embossed plastic sheet material. 244,804, 6-21-77, Cl. D87-3.00G.

Kindred, William B., to Weigl Co., Inc. Appliance for cutting, sealing and making plastic bags. 244,759, 6-21-77, Cl. D15-146.000.

Kobayashi, Yoshiaki, to Nihon Atsudenki Kabushiki Kaisha. Microphone. 244,779, 6-21-77, Cl. D14-12.000.

Kobayashi, Yoshiaki, to Nihon Atsudenki Kabushiki Kaisha. Microphone. 244,780, 6-21-77, Cl. D14-12.000.

Kojima, Hiroshi; Hayakawa, Toshio; and Yoshihara, Masafumi, to Bridgestone Tire Company Limited. Vehicle tire. 244,770, 6-21-77, Cl. D12-142.000.

Kolwaite, John S., to General Electric Company. Portable radio. 244,799, 6-21-77, Cl. D14-75.000.

Lacativo, Arthur J. Planter and a lid therefor. 244,768, 6-21-77, Cl. D11-149.000.

Laroye, Eric. Desk. 244,734, 6-21-77, Cl. D6-175.000.

Latanzi, Lewis A., to Contact Systems, Inc. Component locater for electronic product assembly operations. 244,778, 6-21-77, Cl. D14-99.000.

Latin Percussion, Inc.: *See—*
Cohen, Martin B., 244,787.

Leahy, William F. Vehicle headlamp bezel. 244,797, 6-21-77, Cl. D48-32.00C.

Lincoln Manufacturing Company, Inc.: *See—*
Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 244,735.

Little Giant Corporation: *See—*
Roberts, Leo L.; Davis, Lee W.; and Hollingsworth, Jim S., 244,750.

Long, Stapleton, to Berkline Corporation, The. Chair. 244,730, 6-21-77, Cl. D6-37.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kido, Katsutoshi; and Yamamoto, Susumu, 244,800.

McCord, David W.: *See—*
Wasmer, Roger K. F.; McCord, David W.; and Graziano, Anthony J., 244,762.

Meeker, Paul K. Infant nursing bottle. 244,776, 6-21-77, Cl. D24-47.000.

Morehouse Industries, Inc.: *See—*
Schnear, Donald M., 244,757.

Nescher, Bruce E. Power boat. 244,769, 6-21-77, Cl. D12-62.000.

Nihon Atsudenki Kabushiki Kaisha: *See—*
Kobayashi, Yoshiaki, 244,779.
Kobayashi, Yoshiaki, 244,780.

O'Brien, George, to Tiffany & Company. Cigarette lighter. 244,783, 6-21-77, Cl. D27-36.000.

O'Brien, George, to Tiffany & Company. Cigarette lighter. 244,784, 6-21-77, Cl. D27-36.000.

O'Brien, George, to Tiffany & Company. Cigarette lighter. 244,785, 6-21-77, Cl. D27-36.000.

Odetics, Inc.: *See—*
DeLand, George R., 244,801.

O'Hara, Robert M. Lighting fixture. 244,795, 6-21-77, Cl. D48-23.00R.

Ohlson, Carl-Eric, to AO:s Metall & Mek. Verkstad AB. X-ray unit stand. 244,805, 6-21-77, Cl. D24-2.000.

Owens-Corning Fiberglas Corporation: *See—*
Kies, Jared R., 244,802.
Kies, Jared R., 244,803.
Kies, Jared R., 244,804.

Palka, James J., to General Bathroom Products Corporation. Cabinet door panel. 244,736, 6-21-77, Cl. D6-193.000.

Phillips, Ronald L. Rotary engine model. 244,760, 6-21-77, Cl. D19-62.000.

Powell, Roy R. Crown for a ring. 244,766, 6-21-77, Cl. D11-89.000.

Powers, Fred: *See—*
James, Norman J.; Hickey, Larry G.; and Powers, Fred, 244,731.

Premier Manufacturing Co.: *See—*
Dryden, Littleton P., 244,786.

Puro Co., Inc., The: *See—*
Wilson, Norman E., 244,775.

Roberts, Leo L.; Davis, Lee W.; and Hollingsworth, Jim S., to Little Giant Corporation. Pump. 244,750, 6-21-77, Cl. D15-7.000.

Rohr Industries, Inc.: *See—*
James, Norman J.; Hickey, Larry G.; and Powers, Fred, 244,731.

Ruud, Alan J., to Goulet, Donald L.; and Ruud, Alan J. Lighting fixture. 244,793, 6-21-77, Cl. D48-20.00A.

Saidel, Jack R. Speaker grill. 244,781, 6-21-77, Cl. D14-39.000.

Schnear, Donald M., to Morehouse Industries, Inc. Dispersing apparatus. 244,757, 6-21-77, Cl. D15-122.000.

Slattery, Dugmore Dennis. Metal forming press. 244,758, 6-21-77, Cl. D15-123.000.

Smith, Kendall S., II: *See—*
Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 244,735.

Solf, Johannes Josef, to Friedr. Dick G.m.b.H. Handle for tools. 244,747, 6-21-77, Cl. D8-107.000.

Stabb, Leonard C. Jig for cutting tile. 244,746, 6-21-77, Cl. D8-71.000.

Staub, David E., to Concept, Inc. Penlight. 244,796, 6-21-77, Cl. D48-24.00A.

Steelcase, Inc.: *See—*
Buhk, Randall P., 244,729.

Stefaniak, Philip S., to Stewart-Warner Corporation. Speedometer. 244,763, 6-21-77, Cl. D10-98.000.

Stewart-Warner Corporation: *See—*
Stefaniak, Philip S., 244,763.

Sulek, Eugene Joseph. Digital wrist watch. 244,761, 6-21-77, Cl. D10-38.000.

Sullivan, Edward F., Jr. Golf stance and swing practice device or the like. 244,791, 6-21-77, Cl. D34-5.0CB.

Tammera, Italo. Eyeglass display rack including rotary disks. 244,733, 6-21-77, Cl. D6-136.000.

Tiffany & Company: *See—*
O'Brien, George, 244,783.
O'Brien, George, 244,784.
O'Brien, George, 244,785.

Tohnichi Manufacturing Co. Ltd.: *See—*
Tsuji, Hiroshi, 244,745.

Tsuji, Hiroshi, to Tohnichi Manufacturing Co. Ltd. Torque wrench. 244,745, 6-21-77, Cl. D8-24.000.

Turner, Wendy P. Canister lid. 244,743, 6-21-77, Cl. D7-131.000.

Wasmer, Roger K. F.; McCord, David W.; and Graziano, Anthony J. Electrical leakage analyzer. 244,762, 6-21-77, Cl. D10-75.000.

Watts, Glen A. Hydraulic reset ground ripper implement. 244,751, 6-21-77, Cl. D15-11.000.

Watts, Glen A. Combined ground ripper tooth and hydraulic reset assembly. 244,752, 6-21-77, Cl. D15-29.000.

Watts, Glen A. Ground ripper tooth. 244,753, 6-21-77, Cl. D15-29.000.

WCB Containers Limited: *See—*
Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, 244,788.
Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, 244,789.
Weigl Co., Inc.: *See—*
Kindred, William B., 244,759.
Wilson, Norman E., to Puro Co., Inc., The. Air freshener container. 244,775, 6-21-77, Cl. D23-150.000.
Yamamoto, Susumu: *See—*
Kido, Katsutoshi; and Yamamoto, Susumu, 244,800.
Yoshihara, Masafumi: *See—*
Kojima, Hiroshi; Hayakawa, Toshio; and Yoshihara, Masafumi, 244,770.
Zongker, Floyd E., to Zongker Lead Casting, Inc., (Entire). Decoy anchor. 244,772, 6-21-77, Cl. D12-215.000.
Zongker Lead Casting, Inc., (Entire): *See—*
Zongker, Floyd E., 244,772.

CLASSIFICATION OF PATENTS

ISSUED JUNE 21, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

51 4,030,139
410 4,030,140

CLASS 3

1.1 4,030,141
1.5 4,030,142
1.91 4,030,143

CLASS 4

3 4,030,144
10 4,030,145
172 4,030,147
4,030,148
251 4,030,146

CLASS 5

90 4,030,149

CLASS 7

15 4,030,150

CLASS 8

4,030,880
39 C 4,030,881
39 R 4,030,882
115.5 4,030,883
151.2 4,030,884

CLASS 9

1.7 4,030,151
7 4,030,152

CLASS 10

89 WH 4,030,153

CLASS 12

54.1 4,030,154
146 B 4,030,155

CLASS 13

9 R 4,031,308
10 4,031,309

CLASS 14

16.5 4,030,156

CLASS 15

142 4,030,157
159 A 4,030,158
250.42 4,030,159

CLASS 16

105 4,030,160
186 4,030,161

CLASS 17

1 R 4,030,162
50 4,030,163
70 4,030,164

CLASS 19

.2 4,030,165

CLASS 23

230 B 4,030,885
230.6 4,030,886
232 E 4,030,887
253 R 4,030,888
259.5 4,030,889
281 4,030,890

CLASS 24

156 R 4,030,166
210 4,030,167

CLASS 26

51.5 Re.29,267

CLASS 28

101 4,030,168
115 4,030,170
220 4,030,169

CLASS 29

6 4,030,172
25.19 4,030,173
25.35 4,030,175
33 M 4,030,174
96 4,030,176
116 AD 4,030,177
149.5 NM 4,030,178
156.5 A 4,030,179
252 4,030,183
403 4,030,184
413 4,030,185
427 4,030,186
458 4,030,187
527.1 4,030,188
603 4,030,189
625 4,030,190
741 4,030,180
809 4,030,181
816 4,030,182

CLASS 30

30 4,030,193
133 4,030,196
143 4,030,194
164.9 4,030,195
310 4,030,192

CLASS 32

32 4,030,197
40 R 4,030,199
58 4,030,198

CLASS 33

76 R 4,030,200
174 Q 4,030,201
178 E 4,030,202
241 4,030,203
361 4,030,204

CLASS 34

12 4,030,205
164 4,030,206

CLASS 35

12 E 4,030,207
12 F 4,030,208
18 A 4,030,209
20 4,030,210
35 H 4,030,211

CLASS 36

11.5 4,030,212
30 R 4,030,213
105 4,030,214
119 4,030,215

CLASS 37

58 4,030,216
190 4,030,217

CLASS 40

102 4,030,218
130 R 4,030,219
156 4,030,220

CLASS 42

1 Y 4,030,221
89 4,030,222

CLASS 43

15 4,030,223
24 4,030,224
42.09 4,030,225
55 4,030,226
56 4,030,227
57.5 R 4,030,228
69 4,030,229
81 4,030,230
85 4,030,231
105 4,030,232
121 4,030,233

CLASS 44

1 B 4,030,893
51 4,030,894

CLASS 46

1 R 4,030,234
11 4,030,235
25 4,030,236
53 4,030,237
86 R 4,030,238
135 R 4,030,239
153 4,030,240
180 4,030,241
220 4,030,242
241 4,030,243

CLASS 47

1.7 4,030,244

CLASS 48

111 4,030,895

CLASS 49

490 4,030,245
501 4,030,246

CLASS 51

105 R 4,030,249
128 4,030,250
177 4,030,251
215 R 4,030,252
321 4,030,253
386 4,030,254
419 4,030,247

CLASS 52

9 4,030,255
90 4,030,256
126 4,030,257
208 4,030,258
221 4,030,259
397 4,030,260
511 4,030,261
583 4,030,262
616 4,030,263
693 4,030,264
723 4,030,265

CLASS 53

27 4,030,267
55 4,030,268
61 4,030,269
183 4,030,270
305 4,030,271
376 4,030,272

CLASS 55

33 4,030,896
42 4,030,897

CLASS 56

13.4 4,030,273
13.5 4,030,274
192 4,030,275
291 4,030,276
320.1 4,030,277

CLASS 57

9 4,030,248
34 HS 4,030,278
58.89 4,030,279
58.95 4,030,280
87 4,030,281
124 4,030,282

CLASS 58

23 R 4,030,283
4,030,284
50 R 4,030,285

CLASS 59

7 4,030,286
85 4,030,287

CLASS 60

39.16 R 4,030,288
204 4,030,289
226 A 4,030,290
4,030,291
274 4,030,292
285 4,030,293
407 4,030,294
445 4,030,295
486 4,030,296
521 4,030,297
527 4,030,298
560 4,030,299
639 4,030,300
641 4,030,301
667 4,030,302
688 4,030,303

CLASS 61

1 F 4,030,304
1 R 4,030,305
3 4,030,306
35 4,030,307
45 D 4,030,308
69 R 4,030,309
86 4,030,310
108 4,030,311

CLASS 62

2 4,030,312
7 4,030,313
65 4,030,314
324 4,030,315
345 4,030,898
467 R 4,030,316
514 R 4,030,899
4,030,900

CLASS 63

32 4,030,317

CLASS 65

2 4,030,901
29 4,030,902
32 4,030,903
60 A 4,030,904
135 4,030,905

CLASS 66

28 4,030,318
75.2 4,030,319

CLASS 68

5 R 4,030,320

CLASS 70

34 4,030,321
159 4,030,322
199 4,030,323
232 4,030,324
383 4,030,325

CLASS 71

66 4,030,906
67 4,030,907
78 4,030,908
91 4,030,909
94 4,030,910
98 4,030,911
120 4,030,912

CLASS 72

8 4,030,326
23 4,030,327
45 4,030,328
56 4,030,329
105 4,030,330
110 4,030,331
164 4,030,332
227 4,030,333
258 4,030,334
389 4,030,335
4,030,364
432 4,030,336

CLASS 73

6 4,030,337
4,030,338
12 4,030,339
23 4,030,340
61.1 C 4,030,341
67.5 R 4,030,342
67.8 S 4,030,343
4,030,344
4,030,370
88 E 4,030,345
88.5 R 4,030,346
4,030,347
91 4,030,348
116 4,030,349
117.1 4,030,350
118 4,030,351
4,030,352
139 4,030,353
151 4,030,354
194 VS 4,030,355
195 4,030,356
202 4,030,357
212 4,030,358
231 R 4,030,359
349 4,030,360
353 4,030,361
355 EM 4,030,362
362 AR 4,030,363
393 4,030,365
406 4,030,366
410 4,030,367
419 4,030,368
422 GC 4,030,369

CLASS 74

5 F 4,030,371
217 B 4,030,374
4,030,375
221 4,030,372
230.19 4,030,373
242.11 C 4,030,376
412 R 4,030,377
469 4,030,378
522 4,030,379
866 4,030,380
867 4,030,381

CLASS 75

.5 R 4,030,913
68 R 4,030,914
74 4,030,915
77 4,030,916
103 4,030,917
134 B 4,030,918
214 4,030,919
234 4,030,891

CLASS 76

83 4,030,382

CLASS 81

54 4,030,383
58.3 4,030,384

CLASS 82

48 4,030,385

CLASS 83

4 4,030,386
49 4,030,387
4,030,388
123 4,030,390
137 4,030,391
178 4,030,392
318 4,030,393
409 4,030,394
488 Re.29,268
513 4,030,389

CLASS 84

1.03 4,030,395
1.16 4,030,396
1.22 4,030,397
1.26 4,030,398
304 4,030,399
317 4,030,400

CLASS 87

6 4,030,401

CLASS 90

19 4,030,402

CLASS 91

448 4,030,403

CLASS 92

12.2 4,030,404
58 4,030,405

CLASS 96

1 R 4,030,922
1.5 4,030,921
4,030,923
29 D 4,030,920
61 R 4,030,924
73 4,030,925
90 R 4,030,926
100 4,030,927
107 4,030,928
114 4,030,929
114.1 4,030,930
4,030,931
127 4,030,932

CLASS 99

461 4,030,406

CLASS 100

4 4,030,407

CLASS 101

1 4,030,408
47 4,030,409
120 4,030,410
126 4,030,411
132 4,030,412
232 4,030,413
379 4,030,414
382 R 4,030,415
450 4,030,416
451 4,030,417

CLASS 102

8 4,030,418
24 R 4,030,419
70.2 P 4,030,420
92.3 4,030,421

CLASS 104

131 4,030,422
172 S 4,030,423

CLASS 105

182 R 4,030,424

CLASS 106

15 FP 4,030,933
23 4,030,934
52 4,030,935
65 4,030,936
73.2 4,030,937
73.5 4,030,938
74 4,030,939
308 Q 4,030,940
309 4,030,941

CLASS 108

111 4,030,425

CLASS 109

51 4,030,426
82 4,030,427

CLASS 111

85 4,030,428

CLASS 112

104 4,030,429
121.26 4,030,430
241 4,030,431

CLASS 113

7 R 4,030,432
121 C 4,030,433

CLASS 114

16 R 4,030,434
36 4,030,435
39 4,030,436
46 4,030,437
74 R 4,030,438
106 4,030,439
222 4,030,440
242 4,030,441

CLASS 115

14 4,030,442
70 4,030,443

CLASS 118

257 4,030,444
645 4,030,445
654 4,030,446
658 4,030,447

CLASS 119

1 4,030,448
4,030,449
3 4,030,450
51 R 4,030,451
52 B 4,030,452

CLASS 123

3 4,030,453
8.45 4,030,454
25 B 4,030,456
25 E 4,030,455
34 A 4,030,457
44 D 4,030,458
52 M 4,030,459
117 A 4,030,460
119 A 4,030,463
119 B 4,030,461
119 EC 4,030,462
122 AC 4,030,464
127 4,030,465
146.5 A 4,030,466
4,030,467
148 E 4,030,468
4,030,469
193 C 4,030,470
197 R 4,030,471

CLASS 124

5 4,030,472
35 R 4,030,473

CLASS 126

113 4,030,474
121 4,030,475
246 4,030,476

270 4,030,477
271 4,030,478
287 4,030,479

CLASS 128

1.5 4,030,480
2 H 4,030,482
2 S 4,030,481
2.05 A 4,030,485
2.05 R 4,030,484
2.05 T 4,030,483
2.06 R 4,030,486
24 R 4,030,488
24.1 4,030,487
75 4,030,489
130 4,030,490
140 N 4,030,491
145.8 4,030,492
147 4,030,493
214 R 4,030,494
214.2 4,030,495
215 4,030,496
4,030,497
218 P 4,030,498
250 4,030,499
283 4,030,500
303.14 4,030,501
303.15 4,030,502
304 4,030,503
325 4,030,504
328 4,030,505
330 4,030,506
4,030,507
418 4,030,508
419 D 4,030,509
419 PG 4,030,510

CLASS 131

21 R 4,030,511

CLASS 132

7 4,030,512

CLASS 134

167 R 4,030,513

CLASS 135

25 R 4,030,514
4,030,515

CLASS 137

192 4,030,516
203 4,030,517
246 4,030,518
364 4,030,519
513.5 4,030,520
566 4,030,521
596.13 4,030,522
599 4,030,523
614.06 4,030,524

CLASS 139

18 4,030,526

CLASS 140

92.1 4,030,527
147 Re.29,269

CLASS 141

1 4,030,528
392 4,030,529

CLASS 148

1.5 4,030,942
4,030,943
2 4,030,944
6.2 4,030,945
11.5 P 4,030,946
12.9 4,030,947
33.3 4,030,948
112 4,030,950
147 4,030,951
171 4,030,949
187 4,030,952

CLASS 152

4,030,530

CLASS 156

79 4,030,953
208 Re.29,272
235 4,030,955
290 4,030,956
331 4,030,957
350 4,030,958
457 4,030,959
555 4,030,960
580 4,030,961
583 4,030,962
602 4,030,963
610 4,030,964
616 R 4,030,965
623 Q 4,030,966
628 4,030,954
643 4,030,967

CLASS 162

16 4,030,968
23 4,030,969
168 R 4,030,970
216 4,030,971

CLASS 164

4 4,030,531
66 4,030,532
147 4,030,533
4,030,534
207 4,030,535
274 4,030,536
278 4,030,537
312 4,030,538

CLASS 165

134 4,030,539
172 4,030,540
175 4,030,541

CLASS 166

77.5 4,030,542
117.5 4,030,543
182 4,030,544
191 4,030,545
208 4,030,546
212 4,030,547
279 4,030,548
280 4,030,549
314 4,030,550

CLASS 172

126 4,030,551
663 4,030,552

CLASS 173

1 4,030,553
17 4,030,554
120 4,030,556

CLASS 174

15 C 4,031,310
31 R 4,031,311
52 R 4,031,312
68.5 4,031,313

CLASS 175

4.5 4,030,557
39 4,030,558

CLASS 176

36 R 4,030,972
4,030,973
58 PB 4,030,974
78 4,030,975

CLASS 177

159 4,030,559

CLASS 178

3 4,031,314
50 4,031,316
69.1 4,031,317

CLASS 179

1 A Re.29,273
1 AA 4,031,320
1 D 4,031,318
4,031,319
4,031,321
2 A 4,031,322
6 E 4,031,323
6.3 R 4,031,324
4,031,325
15 FD 4,031,327
15 FS 4,031,326
18 BC 4,031,328
18 BF 4,031,329
41 A 4,031,330
81 A 4,031,331
81 R 4,031,333
84 R 4,031,332
100.11 4,031,334
100.41 K 4,031,335
4,031,336
115.5 H 4,031,337
170.8 4,031,338

CLASS 180

6.48 4,030,560
33 R 4,030,561
34 4,030,562

CLASS 181

147 4,030,563
166 4,030,564

CLASS 182

151 4,030,565

CLASS 184

6.2 4,030,566

CLASS 185

37 4,030,567

CLASS 187

9 E 4,030,568
20 4,030,569
29 R 4,030,570
4,030,571
4,030,572

CLASS 188

1 B 4,030,573
62 4,030,574
71.1 4,030,575
71.8 4,030,576
71.9 4,030,577
134 4,030,578
171 4,030,579
299 4,030,580

CLASS 192

16 4,030,581
67 P 4,030,582
84 C 4,030,583
84 T 4,030,584

CLASS 193

38 4,030,585

CLASS 194

59 4,030,586

CLASS 195

29 4,030,976
66 R 4,030,977
75 4,030,978
103.5 M 4,030,979
139 4,030,980

CLASS 197

1 R 4,030,587
4,030,588
4,030,589
4,030,590
6.4 4,030,592
53 4,030,591

CLASS 198

308 4,030,593
489 4,030,594
778 4,030,595

CLASS 200

38 BA 4,031,339
50 A 4,031,340
52 R 4,031,341
61.12 4,031,343
61.21 4,031,342
61.58 B 4,031,344
67 AA 4,031,345
146 R 4,031,346
148 B 4,031,347
159 R 4,031,348

CLASS 201

2.5 4,030,981
6 4,030,982
23 4,030,983
25 4,030,984

CLASS 202

174 4,030,985

CLASS 203

2 4,030,986

CLASS 204

55 R 4,030,987
98 4,030,988
104 4,030,989
108 4,030,990
158 R 4,030,991
4,030,992
4,030,993
159.11 4,030,994
180 G 4,030,995
192 E 4,030,997
192 R 4,030,996
206 4,030,999
219 4,030,998
252 4,031,000
257 4,031,001

CLASS 206

45.26 4,030,596
.83 4,030,597
356 4,030,598
379 4,030,599
386 4,030,600
387 4,030,601
404 4,030,602
521 4,030,603
4,030,604
525 4,030,605

CLASS 208

113 4,031,002

CLASS 209

3 4,031,003
74 R 4,030,607
212 4,031,004
236 4,031,005
287 4,030,606

CLASS 210

44 4,031,006
59 4,031,007
137 4,031,008
164 4,031,009
202 4,031,010
222 4,031,011
321 A 4,031,012
326 4,031,013
474 4,031,032

CLASS 211

131 4,030,608
162 4,030,609
182 4,030,610
191 4,030,611
192 4,030,612

CLASS 213

166 4,030,613

CLASS 214

1 BB 4,030,615
4,030,616
1 BT 4,030,614
1 CM 4,030,617
6 M 4,030,619
6 P 4,030,618
4,030,620
6.5 4,030,621
17 B 4,030,622
138 R 4,030,623
145 A 4,030,624
147 G 4,030,625
767 4,030,626

CLASS 219

98 4,031,349
99 4,031,350
121 L 4,031,351
212 4,031,352
345 4,031,353
389 4,031,354
502 4,031,355
509 4,031,356

CLASS 220

2.1 A 4,030,627
85 P 4,030,628
211 4,030,629
220 Re.29,270
258 4,030,630
269 4,030,631

CLASS 221

150 A 4,030,632

CLASS 222

1 4,030,633
23 4,030,634
55 4,030,635
102 4,030,636
137 4,030,637
180 4,030,638
189 4,030,639
207 4,030,640
317 4,030,641
368 4,030,642
386 4,030,643
396 4,030,644

CLASS 223

68 4,030,645

CLASS 224

9 4,030,646
29 R 4,030,647
31 4,030,648
45 T 4,030,649

CLASS 225

100 4,030,650

CLASS 226

97 4,030,651
114 4,030,652

CLASS 227

25 4,030,653
110 4,030,654
130 4,030,655
131 4,030,656

CLASS 228

1 R 4,030,657
2 4,030,658

CLASS 229

42 4,030,659
4,030,660
52 B 4,030,661
87 R 4,030,662

CLASS 233

26 4,030,663

CLASS 235

12 4,031,357
61.11 D 4,031,359
61.11 E 4,031,358
91 R Re.29,274
92 C 4,031,361
92 DN 4,031,360
92 FL 4,031,362
150.2 4,031,363
151.11 4,031,368
4,031,369
151.21 4,031,372
151.3 4,031,364
4,031,365
4,031,366
4,031,367
151.32 4,031,373
152 4,031,370
4,031,371
153 AK 4,031,375
153 AM 4,031,374
156 4,031,376
164 4,031,377
4,031,378
175 4,031,379
183 4,031,380

CLASS 239

289 4,030,664
373 4,030,665
526 4,030,666
573 4,030,667
585 4,030,668
590 4,030,669

CLASS 240

6.42 4,031,381
25 4,031,382

CLASS 241

14 4,030,670
15 4,030,671
18 4,030,672

CLASS 242

25 A 4,030,673
55 4,030,674
55.18 4,030,675
55.54 4,030,676
65 4,030,677
67.2 4,030,678
68 4,030,679
78.3 4,030,680
81 4,030,681
107.4 B 4,030,682
149 4,030,683
152.1 4,030,684
199 4,030,685

CLASS 244

3.13 4,030,686
12.5 4,030,687
13 4,030,688
151 B 4,030,689

CLASS 248

225.3 4,030,691
311.3 4,030,690
487 4,030,692

CLASS 249

9 4,030,693
196 4,030,694

CLASS 250

201 4,031,383
203 R 4,031,384
4,031,385
230 4,031,386
252 4,031,387
272 4,031,388
283 4,031,389
307 4,031,390
311 4,031,391
328 4,031,392
332 4,031,393
333 4,031,394
360 4,031,395
385 4,031,396
423 P 4,031,397
458 4,031,398
461 B 4,031,399
468 4,031,400
503 4,031,401
557 4,031,402

CLASS 251

113 4,030,695
288 4,030,696

CLASS 252

8.55 R 4,031,014
46.7 4,031,017
47.5 4,031,018
48.2 4,031,023
50 4,031,015
4,031,016
56 R 4,031,020
56 S 4,031,019
62.1 P 4,031,021
89 R 4,031,022
135 4,031,024
180 4,031,025
182 4,031,026
186 4,031,027
299 4,031,028
301.1 R 4,031,029
373 4,031,030
414 4,031,031
511 4,031,033
522 4,031,034

CLASS 254

8 R 4,030,697
106 4,030,698
108 4,030,699
113 4,030,700
124 4,030,701
134.4 4,030,702
135 R 4,030,703
139.1 4,030,704
4,030,705

CLASS 256

1 4,030,706

CLASS 259

8 4,030,707
4,030,708

CLASS 260

2 N 4,031,036
2.2 R 4,031,037
4,031,038
2.3 4,031,039
2.5 AH 4,031,042
4,031,044
2.5 AM 4,031,035
4,031,049
2.5 AW 4,031,040
2.5 EP 4,031,043
2.5 M 4,031,041
2.5 R 4,031,045
17.2 4,031,046
21 4,031,047
22 CQ 4,031,048
29.2 TN 4,031,050
4,031,051
29.4 R 4,031,052
29.6 MM 4,031,055
29.6 PT 4,031,056
29.6 RW 4,031,053
29.6 T 4,031,054
32.6 R 4,031,057
33.8 UA 4,031,058
37 N 4,031,060
37 SB 4,031,059
42.29 4,031,061
42.45 4,031,062
67.6 R 4,031,064
75 R 4,031,065
77.5 CR 4,031,066
77.5 R 4,031,067
79.3 R 4,031,068
112.5 LH 4,031,069
4,031,070
4,031,071
4,031,072
154 4,031,073
239.1 4,031,076
4,031,077
239.3 D 4,031,078
4,031,079
239.55 C 4,031,074
239.55 D 4,031,075
239.55 R 4,031,080
240 R 4,031,081
243 C 4,031,082
4,031,083
4,031,084
4,031,085
4,031,086
243 R 4,031,087
247.2 A 4,031,088
247.5 DP 4,031,089
248 A 4,031,091
248 C 4,031,090
249.6 4,031,092
251 R 4,031,093
268 PH 4,031,094
270 C 4,031,095
272 4,031,096
285.5 4,031,097
287 C 4,031,098
289 K 4,031,099
290 HL 4,031,100
293.84 4,031,101
294.8 C 4,031,102
295 N 4,031,103
295.5 A 4,031,105
295.5 R 4,031,104
296 H 4,031,107
296 R 4,031,106
297 R 4,031,108
314.5 4,031,109
333 4,031,110
340.3 4,031,111

340.7 4,031,112
343.6 4,031,113
4,031,114
4,031,115
369 4,031,116
397.1 4,031,117
404.5 4,031,118
448.2 B 4,031,119
448.8 R 4,031,120
4,031,121
4,031,122
449.5 4,031,123
456 A 4,031,125
463 4,031,126
465 D 4,031,127
465.4 4,031,124
465.9 4,031,128
468 D 4,031,129
468 K 4,031,130
473 G 4,031,131
514 L 4,031,132
520 C 4,031,134
520 R 4,031,133
530 N 4,031,135
537 N 4,031,136
559 AT 4,031,137
561 N 4,031,138
566 A 4,031,139
575 4,031,160
598 4,031,161
611 A 4,031,140
614 R 4,031,141
632 D 4,031,143
650 R 4,031,142
4,031,144
4,031,145
4,031,146
4,031,147
652 P 4,031,148
654 A 4,031,149
666 A 4,031,151
4,031,152
666 PY 4,031,150
669 A 4,031,153
672 R 4,031,154
674 SA 4,031,155
4,031,156
676 R 4,031,157
683.15 B 4,031,158
4,031,159
837 PV 4,031,162
837 R 4,031,163
857 PG 4,031,164
860 4,031,063
4,031,165
876 B 4,031,166
884 4,031,167
896 4,031,168
897 A 4,031,169
932 4,031,170

CLASS 261

1 4,031,171
24 4,031,173
106 4,031,180

CLASS 264

3 B 4,031,172
14 4,031,174
40.7 4,031,175
45.2 4,031,176
65 4,031,177
4,031,178
91 4,031,179
135 4,031,181

CLASS 266

45 4,030,709
48 4,030,710
123 4,030,711
252 4,030,712

CLASS 267

8 R 4,030,713
21 A 4,030,714
64 R 4,030,715
4,030,716

CLASS 269

118 4,030,717
315 4,030,718
328 4,030,719

CLASS 270

61 F 4,030,720

CLASS 271

3 4,030,721
10 4,030,722
11 4,030,723
64 4,030,724
164 4,030,725
246 4,030,726
276 4,030,727
277 4,030,728

CLASS 272

3 4,030,729

CLASS 273

1 F 4,030,731
29 A 4,030,732
29 BB 4,030,733
30 4,030,734
95 E 4,030,760
95 R 4,030,736
106.5 A 4,030,761
110 4,030,555
134 AD 4,030,762
134 D 4,030,763
148 A 4,030,764
148 R 4,030,765
163 R 4,030,766

CLASS 277

92 4,030,730
235 R 4,030,767

CLASS 280

42 4,030,769
43.23 4,030,770
47.17 4,030,768
88 4,030,771
106 R 4,030,772
153 R 4,030,773
261 4,030,774
408 4,030,171
477 4,030,775
4,030,776
661 4,030,737
681 4,030,738
708 4,030,739
714 4,030,777

CLASS 285

16 4,030,740
161 4,030,741
174 4,030,778
343 4,030,742

CLASS 289

18 4,030,743

CLASS 290

38 R 4,031,403
40 R 4,031,404
55 4,031,405

CLASS 293

71 R 4,030,735
4,030,744

CLASS 294

86.14 4,030,745
88 4,030,746
92 4,030,747

CLASS 296

1 S 4,030,779
100 4,030,780

CLASS 297

184 4,030,748
345 4,030,749
375 4,030,750
397 4,030,781
451 Re.29,271

CLASS 298

1 A 4,030,751

CLASS 299

11 4,030,752

CLASS 301

36 R 4,030,753
98 4,030,754

CLASS 302

29 4,030,755

CLASS 303

24 A 4,030,756
28 4,030,757
84 A 4,030,758
119 4,030,759

CLASS 305

57 4,030,782

CLASS 307

41 4,031,406
87 4,031,407
116 4,031,408
208 4,031,409
209 4,031,410
228 4,031,411
238 4,031,412
4,031,413
270 4,031,414
279 4,031,415
299 A 4,031,416
311 4,031,417
326 4,031,431

CLASS 308

6 C 4,030,191
72 4,030,783
107 4,030,784
187 4,030,785
227 4,030,786
4,030,787

CLASS 310

8.2 4,031,418
49 R 4,031,419
74 4,031,420
112 4,031,421
256 4,031,422

CLASS 312

333 4,030,788

CLASS 313

105 CM 4,031,423
146 4,031,424
346 R 4,031,425
4,031,426
422 4,031,427

CLASS 315

111 4,031,428
169 TV 4,031,429
403 4,031,430

CLASS 316

19 4,030,789
23 4,030,790

CLASS 318

39 4,031,437
227 Re.29,275
331 4,031,438
338 4,031,439
432 4,031,440
480 4,031,441
561 4,031,442
4,031,443
562 4,031,444
568 4,031,445
665 4,031,446
685 4,031,447
696 4,031,448

CLASS 320

2 4,031,449
23 4,031,450
4,031,451

CLASS 321

2 4,031,452
4,031,453
4,031,454

CLASS 322

27 4,031,455

CLASS 323

4 4,031,456
36 4,031,458
60 4,031,459
92 4,031,457

CLASS 324

34 R 4,031,460
51 4,031,461
77 A 4,031,463
77 B 4,031,462
78 Z 4,031,464
158 SC 4,031,465
175 4,031,466

CLASS 325

54 4,031,467
312 4,031,468
363 4,031,469
396 4,031,470
423 4,031,471
446 4,031,472
455 4,031,473
4,031,474
4,031,475

CLASS 328

39 4,031,476
70 4,031,477
134 4,031,478

CLASS 329

50 4,031,479

CLASS 330

10 4,031,480
30 D 4,031,495
35 4,031,481
4,031,482

CLASS 331

17 4,031,483
94.5 G 4,031,484
94.5 P 4,031,485
96 4,031,486

CLASS 333

1 4,031,487
21 A 4,031,488
24.2 4,031,489
70 T 4,031,490

CLASS 334

15 4,031,491

CLASS 335

16 4,031,492
128 4,031,493
154 4,031,494

CLASS 336

135 4,031,496

CLASS 338

21 4,031,498
23 4,031,499
308 4,031,497

CLASS 339

5 M 4,030,791
17 LC 4,030,792
19 4,030,793
22 B 4,030,794
37 4,030,795
61 R 4,030,796
64 M 4,030,797
89 R 4,030,798
99 R 4,030,799
107 4,030,800
121 4,030,801
192 R 4,030,802
217 S 4,030,803
258 S 4,030,804

CLASS 340

6 R 4,031,500
4,031,501
10 4,031,502
11 4,031,503
15.5 DP 4,031,505
15.5 GC 4,031,504
4,031,506
41 R 4,031,507
58 4,031,508
62 4,031,509
4,031,510
146.2 4,031,511
147 R 4,031,512
152 T 4,031,513
173 R 4,031,522
4,031,523
4,031,524
174 MS 4,031,525
174 TF 4,031,526
279 4,031,527
310 R 4,031,528
324 R 4,031,529
347 NT 4,031,530
4,031,532
4,031,533
347 SY 4,031,531

CLASS 343

6.5 R 4,031,535
12 MD 4,031,534
704. 4,031,537
781 CA 4,031,538
796 4,031,536
797 4,031,539
860 4,031,540

CLASS 346

1 4,031,561
35 4,031,562
75 4,031,563

CLASS 350

2 4,030,805
7 4,030,806
4,030,807
36 4,030,808
96 C 4,030,809
4,030,810
4,030,811
157 4,030,812
161 S 4,030,813
238 4,030,814
255 4,030,815
294 4,030,816
314 4,030,817

CLASS 352

72 4,030,818
79 4,030,819
91 C 4,030,820

CLASS 353

71 4,030,821
103 4,030,822

CLASS 354

32 Re.29,276

CLASS 355

8 4,030,823
15 4,030,824
71 4,030,825
104 4,030,826

CLASS 356

75 4,030,827
96 4,030,828
97 4,030,829
109 4,030,830
4,030,831
111 4,030,835
118 4,030,836
152 4,030,832
175 4,030,833
197 4,030,834
209 4,030,837
219 4,030,838
251 4,030,839
256 4,030,840

CLASS 358

56 4,031,541
60 4,031,542
86 4,031,543
99 4,031,544
108 4,031,545
128 4,031,546
167 4,031,547
188 4,031,548
193 4,031,549
212 4,031,315
216 4,031,550
223 4,031,551
241 4,031,552
247 4,031,553

CLASS 360

73 4,031,554
94 4,031,555
96 4,031,556
4,031,557
130 4,031,558

CLASS 361

7 4,031,432
52 4,031,559
172 4,031,434
175 4,031,560
186 4,031,435
301 4,031,436
338 4,031,433

CLASS 364

200 4,031,514
4,031,515
4,031,516
4,031,517
4,031,518
4,031,520
4,031,521
900 4,031,519

CLASS 401

6 4,030,841
195 4,030,842
213 4,030,844
268 4,030,845

CLASS 403

231 4,030,846
263 4,030,847
272 4,030,848
4,030,849
288 4,030,850
405 4,030,266

CLASS 404

25 4,030,851
66 4,030,852

CLASS 408

10 4,030,853
115 B 4,030,854
197 4,030,843
226 4,030,855

CLASS 415

80 4,030,856

CLASS 417

46 4,030,857
56 4,030,858
61 4,030,859
63 4,030,860

CLASS 418

27 4,030,861
48 4,030,862

CLASS 423

127 4,031,182
175 4,031,183
197 4,031,184
239 4,031,185
392 4,031,187
447.6 4,031,188
449 4,031,189
466 4,031,190
485 4,031,191
488 4,031,192
490 4,031,193
500 4,031,194
554 4,031,195
624 4,031,196

CLASS 424

1 4,031,197
4,031,198
12 4,031,199
27 4,031,200
4,031,201
28 4,031,202
89 4,031,203
90 4,031,204
94 4,031,205
117 4,031,206
118 4,031,207
119 4,031,208
150 4,031,209
180 4,031,210
4,031,211
182 4,031,212
229 4,031,213
4,031,214
244 4,031,215
250 4,031,216
251 4,031,217
253 4,031,218
258 4,031,219
4,031,220
267 4,031,221
4,031,222
4,031,223
4,031,224
4,031,225
4,031,226
270 4,031,227
4,031,228
271 4,031,229
4,031,230
272 4,031,231
273 4,031,232
4,031,233
4,031,234
274 4,031,235
275 4,031,236
278 4,031,237
304 4,031,239
308 4,031,240
311 4,031,241
4,031,242
317 4,031,243
324 4,031,186
330 4,031,244
4,031,245
331 4,031,246
337 4,031,247
347 4,031,248
4,031,249

CLASS 425

17 4,030,863
65 4,030,864
82 4,030,865
116 4,030,866
144 4,030,867
149 4,030,868
247 4,030,869
383 4,030,870
388 4,030,871
393 4,030,872
456 4,030,873

CLASS 426

18 4,031,250
285 4,031,238
387 4,031,251
445 4,031,252
482 4,031,253
534 4,031,255
535 4,031,256
4,031,257
548 4,031,258
4,031,259
4,031,260
565 4,031,261
4,031,262
573 4,031,254
588 4,031,263
590 4,031,264
599 4,031,265
4,031,266
656 4,031,267

CLASS 427

12 4,031,268
24 4,031,269
27 4,031,270
43 4,031,271
96 4,031,272
158 4,031,273
229 4,031,274

CLASSIFICATION OF PATENTS

248 R	4,031,275	222	4,031,284	586	4,030,525	116	4,031,296	144	4,030,879		CLASS 528
369	4,031,276	226	4,030,892		CLASS 429		CLASS 431		CLASS 526	486	4,031,302
388 R	4,031,277	280	4,031,283			9	4,030,874				CLASS 536
423	4,031,278	294	4,031,285	40	4,031,291	352	4,030,875	87	4,031,297	5	4,031,303
	CLASS 428	324	4,031,286		4,031,292		CLASS 432	113	4,031,298	11	4,031,304
44	4,031,279	379	4,031,287	60	4,031,293	14	4,030,876	193	4,031,299	114	4,031,305
88	4,031,280	395	4,031,288	82	4,031,294	29	4,030,877	308	4,031,300		4,031,306
90	4,031,281	451	4,031,289	100	4,031,295	45	4,030,878	328	4,031,301		4,031,307
141	4,031,282	480	4,031,290								

CLASSIFICATION OF DESIGNS

D2—	265	244,726		14	244,740	D11—	40	244,765		82	244,801	D22—	18	244,773		5 GH	244,792
	287	244,727		17	244,741		89	244,766		99	244,778	D23—	69	244,774		5 H	244,788
D4—	31	244,728			244,742		137	244,767	D15—	7	244,750		150	244,775			244,789
D6—		244,729		131	244,743		149	244,768		11	244,751	D24—	2	244,805		15 C	244,787
	37	244,730	D8—	8	244,744	D12—	62	244,769		29	244,752		47	244,776	D48—	20 A	244,793
	48	244,731		24	244,745		142	244,770			244,753	D25—	75	244,777		20 E	244,794
	76	244,732		71	244,746		193	244,771		66	244,754	D27—	36	244,782		23 R	244,795
	136	244,733		107	244,747		215	244,772			244,755			244,783		24 A	244,796
	175	244,734		380	244,748	D14—	5	244,800		98	244,756			244,784		32 C	244,797
	193	244,735	D9—	238	244,749		12	244,779		122	244,757			244,785	D56—	1 E	244,798
		244,736	D10—	38	244,761			244,780		123	244,758	D30—	15	244,786	D87—	3 G	244,802
	257	244,737		75	244,762		39	244,781		146	244,759	D34—	5 BC	244,790			244,803
D7—	3	244,738		98	244,763		75	244,799	D19—	62	244,760		5 CB	244,791			244,804
	13	244,739		113	244,764												

CLASSIFICATION OF PLANTS

P.—	15	4,063		43	4,064		68	4,062			

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,030,225	4,030,476	4,031,038	4,031,371	12 : 4,030,148	4,030,551
2 : 4,030,747	4,030,477	4,031,049	4,031,450	4,030,232	4,030,559
4 : 4,030,194	4,030,491	4,031,087	4,031,521	4,030,356	4,030,566
4,030,442	4,030,504	4,031,100	9 : 4,030,177	4,030,360	4,030,568
4,030,483	4,030,506	4,031,114	4,030,179	4,030,361	4,030,575
4,030,797	4,030,518	4,031,115	4,030,195	4,030,419	4,030,586
4,031,028	4,030,523	4,031,173	4,030,220	4,030,449	4,030,592
4,031,385	4,030,527	4,031,181	4,030,289	4,030,585	4,030,611
4,031,462	4,030,544	4,031,197	4,030,317	4,030,691	4,030,613
4,031,483	4,030,587	4,031,209	4,030,327	4,030,718	4,030,620
4,031,486	4,030,603	4,031,228	4,030,373	4,030,751	4,030,621
5 : 4,030,626	4,030,618	4,031,234	4,030,378	4,030,801	4,030,623
4,030,670	4,030,634	4,031,241	4,030,446	4,030,851	4,030,649
4,030,843	4,030,645	4,031,247	4,030,556	4,031,373	4,030,659
4,030,871	4,030,646	4,031,260	4,030,640	4,031,420	4,030,660
6 : Re.29,269	4,030,651	4,031,265	4,030,706	4,031,513	4,030,664
4,030,145	4,030,663	4,031,279	4,030,722	13 : 4,030,205	4,030,693
4,030,146	4,030,676	4,031,285	4,030,723	4,030,226	4,030,694
4,030,158	4,030,678	4,031,296	4,030,741	4,030,261	4,030,712
4,030,197	4,030,686	4,031,333	4,030,783	4,030,474	4,030,717
4,030,198	4,030,703	4,031,348	4,030,813	4,030,537	4,030,724
4,030,199	4,030,704	4,031,355	4,030,831	4,030,863	4,030,730
4,030,210	4,030,733	4,031,357	4,030,842	4,030,941	4,030,736
4,030,213	4,030,737	4,031,364	4,030,972	4,031,195	4,030,753
4,030,221	4,030,752	4,031,372	4,030,975	16 : 4,030,709	4,030,765
4,030,224	4,030,768	4,031,377	4,031,021	17 : Re.29,274	4,030,798
4,030,229	4,030,775	4,031,379	4,031,068	4,030,172	4,030,802
4,030,237	4,030,779	4,031,389	4,031,077	4,030,178	4,030,816
4,030,239	4,030,803	4,031,399	4,031,108	4,030,184	4,030,821
4,030,262	4,030,807	4,031,424	4,031,137	4,030,219	4,030,841
4,030,264	4,030,829	4,031,437	4,031,169	4,030,227	4,030,853
4,030,265	4,030,832	4,031,444	4,031,206	4,030,234	4,030,894
4,030,285	4,030,836	4,031,469	4,031,217	4,030,235	4,030,919
4,030,300	4,030,847	4,031,479	4,031,283	4,030,238	4,031,006
4,030,303	4,030,848	4,031,488	4,031,322	4,030,251	4,031,019
4,030,310	4,030,849	4,031,507	4,031,341	4,030,255	4,031,154
4,030,324	4,030,854	4,031,510	4,031,363	4,030,266	4,031,242
4,030,340	4,030,877	4,031,519	4,031,367	4,030,288	4,031,254
4,030,342	4,030,906	4,031,520	4,031,402	4,030,307	4,031,270
4,030,348	4,030,907	4,031,522	4,031,423	4,030,377	4,031,292
4,030,349	4,030,910	4,031,526	4,031,433	4,030,385	4,031,295
4,030,353	4,030,914	4,031,534	4,031,484	4,030,391	4,031,298
4,030,358	4,030,936	8 : 4,030,141	10 : 4,030,168	4,030,412	4,031,312
4,030,362	4,030,943	4,030,150	4,030,388	4,030,435	4,031,319
4,030,383	4,030,952	4,030,214	4,030,880	4,030,466	4,031,328
4,030,392	4,030,953	4,030,276	4,030,912	4,030,470	4,031,332
4,030,399	4,030,984	4,030,363	4,031,058	4,030,484	4,031,340
4,030,426	4,030,996	4,030,396	4,031,106	4,030,488	4,031,345
4,030,438	4,030,997	4,030,796	4,031,111	4,030,494	4,031,346
4,030,455	4,030,999	4,030,840	4,031,168	4,030,495	4,031,414
4,030,458	4,031,005	4,030,923	4,031,191	4,030,497	4,031,460
4,030,471	4,031,012	4,031,059	4,031,299	4,030,498	4,031,461
4,030,472	4,031,027	4,031,182	11 : 4,030,147	4,030,513	4,031,466

4,031,524
4,031,540
4,031,559
18 : 4,030,246
4,030,260
4,030,440
4,030,654
4,030,695
4,030,794
4,030,839
4,030,845
4,030,852
4,031,017
4,031,082
4,031,084
4,031,097
4,031,107
4,031,272
4,031,560
19 : 4,030,560
4,030,782
4,030,963
4,031,386
20 : 4,030,322
4,030,959
21 : 4,030,157
4,030,187
4,030,524
4,030,610
4,030,655
4,030,740
22 : 4,030,140
4,030,280
4,030,309
4,030,354
4,030,503
4,030,543
4,030,546
4,030,745
4,031,007
4,031,143
4,031,318
4,031,360
23 : 4,030,679
24 : 4,030,200
4,030,259
4,030,271
4,030,417
4,030,427
4,030,867
4,030,978
4,031,060
4,031,172
4,031,271
4,031,282
4,031,289
4,031,338
25 : Re.29,275
4,030,171
4,030,183
4,030,192
4,030,243
4,030,439
4,030,450
4,030,480
4,030,490
4,030,605
4,030,622
4,030,638
4,030,656
4,030,666
4,030,681
4,030,700
4,030,793
4,030,817
4,030,826
4,030,955
4,030,986
4,031,009
4,031,057
4,031,167
4,031,238
4,031,401
4,031,431
4,031,434
4,031,436
4,031,446
4,031,449
4,031,451
4,031,457
4,031,517
4,031,528
4,031,532
4,031,533
4,031,536
4,031,537
4,031,545
26 : Re.29,271
4,030,176
4,030,182

4,030,244
4,030,256
4,030,297
4,030,299
4,030,314
4,030,351
4,030,352
4,030,365
4,030,423
4,030,432
4,030,443
4,030,517
4,030,576
4,030,606
4,030,609
4,030,647
4,030,648
4,030,650
4,030,658
4,030,662
4,030,668
4,030,713
4,030,719
4,030,728
4,030,756
4,030,757
4,030,781
4,030,788
4,030,795
4,030,860
4,030,869
4,030,938
4,030,947
4,031,044
4,031,069
4,031,070
4,031,071
4,031,072
4,031,081
4,031,101
4,031,121
4,031,122
4,031,142
4,031,147
4,031,267
4,031,268
4,031,277
4,031,304
4,031,344
4,031,359
4,031,369
4,031,405
4,031,442
27 : 4,030,188
4,030,223
4,030,228
4,030,273
4,030,277
4,030,428
4,030,501
4,030,625
4,030,628
4,030,690
4,030,750
4,030,792
4,030,812
4,030,958
4,031,032
4,031,036
4,031,048
4,031,092
4,031,188
4,031,190
4,031,198
4,031,261
4,031,342
4,031,463
4,031,464
28 : 4,030,565
29 : 4,030,164
4,030,250
4,030,424
4,030,461
4,030,479
4,030,482
4,030,729
4,030,778
4,030,885
4,030,890
4,030,995
4,031,164
4,031,170
4,031,218
30 : 4,030,911
31 : 4,031,204
4,031,468
32 : 4,030,414
33 : 4,030,155
4,030,451
4,030,619

4,030,895
4,030,966
4,031,176
4,031,426
34 : 4,030,161
4,030,204
4,030,211
4,030,316
4,030,323
4,030,359
4,030,401
4,030,418
4,030,433
4,030,444
4,030,452
4,030,502
4,030,507
4,030,520
4,030,569
4,030,570
4,030,597
4,030,629
4,030,657
4,030,684
4,030,815
4,030,835
4,030,850
4,030,868
4,030,892
4,030,901
4,030,908
4,030,918
4,030,933
4,030,994
4,031,034
4,031,056
4,031,061
4,031,063
4,031,085
4,031,086
4,031,090
4,031,091
4,031,110
4,031,125
4,031,140
4,031,144
4,031,145
4,031,146
4,031,151
4,031,155
4,031,156
4,031,161
4,031,221
4,031,224
4,031,227
4,031,231
4,031,233
4,031,237
4,031,239
4,031,250
4,031,256
4,031,257
4,031,258
4,031,266
4,031,284
4,031,300
4,031,301
4,031,306
4,031,307
4,031,310
4,031,324
4,031,325
4,031,374
4,031,376
4,031,397
4,031,408
4,031,427
4,031,429
4,031,465
4,031,476
4,031,501
4,031,538
4,031,539
4,031,543
4,031,546
4,031,549
35 : 4,030,555
4,030,557
4,031,393
36 : Re.29,273
4,030,153
4,030,156
4,030,159
4,030,166
4,030,173
4,030,180
4,030,181
4,030,190
4,030,207

4,030,208
4,030,222
4,030,233
4,030,242
4,030,254
4,030,257
4,030,286
4,030,302
4,030,318
4,030,413
4,030,416
4,030,429
4,030,499
4,030,505
4,030,545
4,030,547
4,030,563
4,030,581
4,030,583
4,030,590
4,030,591
4,030,608
4,030,627
4,030,643
4,030,677
4,030,698
4,030,738
4,030,742
4,030,748
4,030,780
4,030,785
4,030,790
4,030,814
4,030,824
4,030,825
4,030,844
4,030,875
4,030,903
4,030,920
4,030,925
4,030,932
4,030,948
4,030,980
4,030,981
4,030,991
4,030,992
4,030,993
4,031,042
4,031,045
4,031,054
4,031,088
4,031,093
4,031,095
4,031,109
4,031,113
4,031,123
4,031,127
4,031,178
4,031,184
4,031,246
4,031,255
4,031,259
4,031,278
4,031,305
4,031,336
4,031,343
4,031,350
4,031,396
4,031,416
4,031,422
4,031,478
4,031,535
37 : Re.29,267
4,030,142
4,030,341
4,030,402
4,030,489
4,030,554
4,030,689
4,030,702
4,030,707
4,030,873
4,031,029
4,031,124
4,031,382
4,031,511
38 : 4,030,705
4,030,859
39 : Re.29,268
4,030,186
4,030,258
4,030,269
4,030,291
4,030,298
4,030,321
4,030,384
4,030,409
4,030,425
4,030,456

4,030,478
4,030,493
4,030,530
4,030,553
4,030,584
4,030,589
4,030,631
4,030,639
4,030,642
4,030,653
4,030,708
4,030,784
4,030,799
4,030,857
4,030,965
4,031,010
4,031,015
4,031,023
4,031,118
4,031,126
4,031,149
4,031,200
4,031,202
4,031,251
4,031,274
4,031,281
4,031,288
4,031,297
4,031,317
4,031,349
4,031,400
4,031,493
4,031,494
4,031,518
4,031,530
4,031,561
4,031,563
40 : 4,030,162
4,030,345
4,030,369
4,030,370
4,030,473
4,030,549
4,030,889
4,030,917
4,031,002
4,031,014
4,031,153
4,031,180
4,031,555
41 : 4,030,253
4,030,552
4,030,838
42 : 4,030,152
4,030,175
4,030,230
4,030,252
4,030,301
4,030,304
4,030,312
4,030,315
4,030,355
4,030,366
4,030,397
4,030,421
4,030,448
4,030,486
4,030,509
4,030,599
4,030,600
4,030,604
4,030,612
4,030,630
4,030,692
4,030,696
4,030,734
4,030,766
4,030,791
4,030,800
4,030,823
4,030,866
4,030,887
4,030,905
4,030,945
4,030,946
4,030,950
4,030,982
4,030,988
4,031,050
4,031,051
4,031,055
4,031,079
4,031,120
4,031,131
4,031,150
4,031,175
4,031,186
4,031,196
4,031,203

4,031,222
4,031,223
4,031,252
4,031,275
4,031,291
4,031,311
4,031,320
4,031,329
4,031,362
4,031,404
4,031,407
4,031,492
4,031,509
4,031,512
4,031,542
44 : 4,030,202
4,030,720
4,030,962
45 : Re.29,272
4,030,313
4,030,582
4,030,743
4,031,162
4,031,280
47 : 4,030,331
4,030,834
4,030,882
4,031,004
48 : Re.29,270
4,030,203
4,030,217
4,030,311
4,030,347
4,030,364
4,030,548
4,030,550
4,030,710
4,030,746
4,030,762
4,030,774
4,030,856
4,030,858
4,030,893
4,030,939
4,031,003
4,031,018
4,031,053
4,031,117
4,031,138
4,031,366
4,031,415
4,031,467
4,031,474
4,031,477
4,031,504
4,031,505
4,031,506
49 : 4,030,754
4,031,544
50 : 4,030,942
4,030,979
51 : 4,030,218
4,030,519
4,030,661
4,030,830
4,031,035
4,031,245
4,031,384
4,031,417
4,031,531
4,031,552
53 : 4,030,151
4,030,240
4,030,241
4,030,290
4,030,481
4,030,487
4,030,578
4,030,633
4,030,687
4,030,787
4,031,387
4,031,398
4,031,406
4,031,432
54 : 4,030,542
4,031,067
55 : 4,030,139
4,030,295
4,030,390
4,030,510
4,030,760
4,030,361
4,030,960
4,030,971
4,031,129
4,031,290
4,031,339
4,031,440

4	:	244,756	9	:	244,778			244,746	29	:	244,775
6	:	244,726	12	:	244,774	24	:	244,744	31	:	244,762
		244,731			244,791	26	:	244,728	32	:	244,798
		244,737			244,796			244,729	33	:	244,792
		244,757	17	:	244,736			244,759	34	:	244,733
		244,768			244,763			244,760			244,787
		244,769			244,765			244,771	36	:	244,783
		244,801			244,781			244,773			244,784
8	:	244,743			244,797	27	:	244,790			244,785
		244,786	18	:	244,735			244,795			244,799

39	:	244,776	47	:	244,730						
		244,802	48	:	244,748						
		244,803			244,749						
		244,804			244,761						
40	:	244,750			244,767						
		244,772									
41	:	244,751	51	:	244,754						
		244,752			244,755						
		244,753	54	:	244,794						
42	:	244,766	55	:	244,793						

PLANT PATENTS

6	:	4,064	48	:	4,062						

U. S. GOVERNMENT PRINTING OFFICE : O - 1977

U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*